LIBRARY
CURRENT SERIAL RECORD
JAN 26 1945
U.S. DEPARTMENT OF AGRICULTURE

THE PLANT DISEASE REPORTER

Issued by

THE PLANT DISEASE SURVEY, DIVISION OF MYCOLOGY AND DISEASE SURVEY
BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING
AGRICULTURAL RESEARCH ADMINISTRATION
UNITED STATES DEPARTMENT OF AGRICULTURE

Volume XXVIII February 1, 1944 Number 3

The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

IN THIS ISSUE

The Southern Cooperative Corn Disease Research Committee, J. H. McLaughlin, Chairman, reports results of corn seed treatment tests, page - 64.

M. I. Lohman and I. E. Stokes discuss conditions favoring "anthracnose and red rot years" on sorgo in Mississippi, page - 76.

Leland Shanor and Carlton F. Taylor report Diaporthe sojae occurring on cowpeas in Virginia, page - 81. In shorter notes, Eldow Reeve and Robert H. Daines report boron deficiency in New Jersey apple orchards, and Donald P. Limber reports Penicillium gladioli isolated from a diseased yam from Cuba.

C. J. Nusbaum summarizes reports on seasonal spread and development of cucurbit downy mildew in the Atlantic Coast region, page - 82.

A. L. Taylor continues his reports on the nematode survey in Florida, page - 85.

Reports on tomato diseases, page - 87.

Reports on diseases of spinach, page - 87.

Reports on diseases of cruciferous crops, page - 89.

Aster yellows and other diseases of carrots in the Texas Winter Garden Region are reported by Howard W. Larsh, page - 91.

Diseases of other vegetable crops in winter truck-growing areas, page - 92.

Storage rots of potatoes in North Dakota reported by Ian M. Tervet, page - 94, include an unusual development of Alternaria tuber rot.

Other reports on potato diseases, page - 96.

G. M. Watkins, page - 100, reports on diseases of stored sweetpotatoes in Texas.

Diseases of stored fruits and vegetables in Massachusetts are reported by R. C. Cassell, page - 101.

William A. Murrill lists some fungi on trees in Florida, page - 103.

T. W. Bretz notes fruit tree diseases observed in a survey of Missouri nurseries, page - 112.

Brief notes and a correction, page - 114.

SOUTHERN COOPERATIVE CORN DISEASE RESEARCH COMMITTEE PROGRESS REPORT FOR 1943

J. Harvey McLaughlin, Chairman

The Southern Cooperative Corn Disease Research Committee was organized in January, 1943, to plan and carry on a coordinated attack on the corn disease problems of the Southern States. In view of the meager and inadequate information available on the major seed- and soil-borne pathogens responsible for the poor stands and yields in the various parts of the South, it was decided to focus the cooperative work of the first year on obtaining information concerning the distribution and abundance of the chief seed- and soil-borne pathogens attacking corn in the different states. At the same time a program of uniform seed treatment tests was formulated on a moderate scale. The objectives established for 1943 were to obtain evidence on: (1) The advisability of recommending corn seed treatments in the Southern States; (2) The most effective chemical compounds to use for corn seed treatment; (3) The identity of the corn seedling pathogens present and active in the various areas of the South; and (4) the environmental relationships of the corn seedling pathogens.

Materials and Methods. Sacks of corn seed were shipped by various cooperators to the Oklahoma Agricultural Experiment Station for chemical treatment and parcelling into sublots for redistribution to all of the individual cooperators. Samples of each of the main lots were sent to C. H. Arndt in South Carolina, who obtained the information on germination and seed-borne fungi presented in Table 1. Germination was determined by placing single kernels in test tubes on water agar. The $HgCl_2$-treated seed, after treatment in $HgCl_2$ solution, were shaken for 3 minutes in a 50% ethanol solution, rinsed in sterile water, then placed in test tubes. Percentage germination was determined from 50 seeds of each sample held at 20°C (-1/2°) for a period of 14 days.

Two tests were proposed for the 1943 cooperative work. Test A was designed to compare seedling stands obtained from nontreated seed, with those from Semesan Jr. treated seed on 7 or 8 lots of seed. Test B was designed to compare 5 chemical dust treatments with a nontreated sample and also for comparisons of the chemicals with one another in their effectiveness. The chemicals used in the B-test were Semesan Jr., Spergon, Arasan, Barbak-D and Dubay 1451-D[1].

All dusts were applied at the rate of 3 oz. of dust per bushel of seed. Subsequently, all excess dust was screened from each portion of seed. Koehler[2] found that when excess dust is added to seed, and the seed screened, about 1 1/2 oz. of dust actually remains on a bushel of seed.

---

1 These chemicals were supplied through the courtesy of the respective manufacturers.

2 Koehler, B., 1941. Ill. Agri. Exp. Sta. Bul. 476.

Table 1. Data on germination and seed-borne fungi of the seed lots used in the 1943 corn seed treatment A and B tests[1].

			Nontreated Seed											$HgCl_2$ Treated Seed										
Source of Seed	Lot number	Variety	Total germination	Percentage infested	Fusarium moniliforme	Penicillium sp.	Rhizopus sp.	Rhinotrichum sp.	Diplodia zeae	Cephalosporium acremonium	Aspergillus sp.	Fusarium sp.	Unidentified fungi	Total germination	Percentage infested	Fusarium moniliforme	Penicillium sp.	Rhizopus sp.	Rhinotrichum sp.	Diplodia zeae	Cephalosporium acremonium	Aspergillus sp.	Fusarium sp.	Unidentified fungi
Miss.	1	Mosby	84%	84	78	24	2	2						86%	22	24				2		4		
Okla.	2	Hays Golden	86	86	80	10	8	4						84	22	20	2	6			4	4		
N.C.	4	Jarvis Golden Prolific	88	88	90	26	8	8						82	8	8	6				2			
S. C.	4	Wood's Golden Dent	92	92	89	32		4		2			4	80	2	2								
Va.	5		86	86	82	14								80	10	16					2		6	2
Tenn.	6	Neal Paymaster	94	94	91	8	8	36		2				90	12	10								12
Ark.	7	Delta Prolific	90	90	86	18	6	6		4	2		2	98	24	10								16
La.	8	Yellow Creole	94	94	91		30	20				2		96	14	14								6

1 Data from C. H. Arndt of South Carolina

The majority of cooperators used the split-plot design of field arrangement of plots in both their A and B tests; exceptions were the South Carolina and Arkansas Stations (A-test only). In each instance where the split-plot design was used, the seed lots were used as the whole plot with the treatments as the subplots. The plots in test A were usually 50 feet in length whereas those in test B were 25 feet. Different rates of planting were employed by the various cooperators.

As a means toward establishing uniform methods of obtaining data, suggestions were forwarded to cooperators as to time for taking stand counts, and a standardized isolation technique was advocated.

Results. I. A-test data. Comparison of Semesan Jr. treatment of seed with nontreatment.

Seedling stand data:

Of the 111 comparisons between Semesan Jr. treated and nontreated seed in the 16 tests, 73.9% of the treated means exceeded the nontreated means with 21.9% of these treated means significant and 8.5% highly significant over the nontreated mean. There was only one instance (0.9%) in which a nontreated mean was significantly larger than the treated mean. Comparison of mean seedling stands obtained from treated seed with mean seedling stands from nontreated seed in individual tests show that seedling stands from treated seed were significantly greater in 37.5% and highly significantly greater in 31.3% of the 16 plantings.

In Table 2 are presented the total numbers of seedlings obtained from treated and nontreated seed in all of the A-test plantings.

Table 3, gives the significance of results of 16 A-test plantings planted in 13 different locations by 9 cooperators.

Mean temperature as related to seedling stands: Table 4 contains data which are graphically represented in figures 1, 2, and 3 showing the relationships of mean temperatures, soil pH, and total precipitation to mean seedling stands of treated and nontreated seed in the locations from which such data were obtained. Regression coefficients were determined for each comparison and regression lines constructed. The data in figure 1 indicate a high correlation between the mean temperature of a 12-day period following planting, and the seedling stands obtained.

The two graphs of figure 2 indicate that a relationship exists between soil pH and mean seedling stands similar to that between mean temperatures and seedling stands, whereas figure 3 indicates no relationship between the total precipitation received during the 12-day period following planting, and the mean seedling stands.

Yield data: Cooperators in Georgia, South Carolina, and Mississippi obtained yield data from their A-test plantings. Analysis of these data indicate that there were no significant differences in yield obtained from seed treatment, probably because excessive rates of seeding were used with subsequent thinning to uniform stands.

Table 2. Total numbers of seedlings obtained from treated and nontreated seed from each of the 16 plantings of the A-test.

Location of planting	Nontreated Seed		Semesan Jr. Treated Seed	
	Total seedlings per planting	Mean seedlings per plot	Total seedlings per planting	Mean seedling per plot
Rocky Mount, N.C.	2018	72.07	2120	75.77
Statesville, N.C.	1897	67.75	2183	77.96
Wenona, N. C.	2375	84.80	2313	82.60
Blacksburg, Va.	6801	161.93	7118	169.48
Knoxville, Tenn.				
Planted 4/16/43	2314	82.64	2413	86.18
" 4/29/43	2058	73.50	2130	76.07
" 5/20/43	2268	81.00	2366	84.50
Jackson, Tenn.	3226	76.81	3470	82.62
Clarkdale, Ark.	509	127.30	572	143.00
Fairplay, S. C.	40,119	835.80	40,372	841.10
Denver, S. C.	32,557	678.30	33,306	693.90
Sixmile, S.C.	35,270	734.80	37,432	779.60
Stillwater, Okla.	7,019	146.23	7,147	148.94
Experiment, Ga.	4,429	92.30	4,562	95.00
State College, Miss.				
Planted 4/14/43	2,737	78.20	2,863	81.80
" 5/20/43	2,788	79.66	2,892	82.63
Total	148,385	3,473.09	153,250	3,601.09

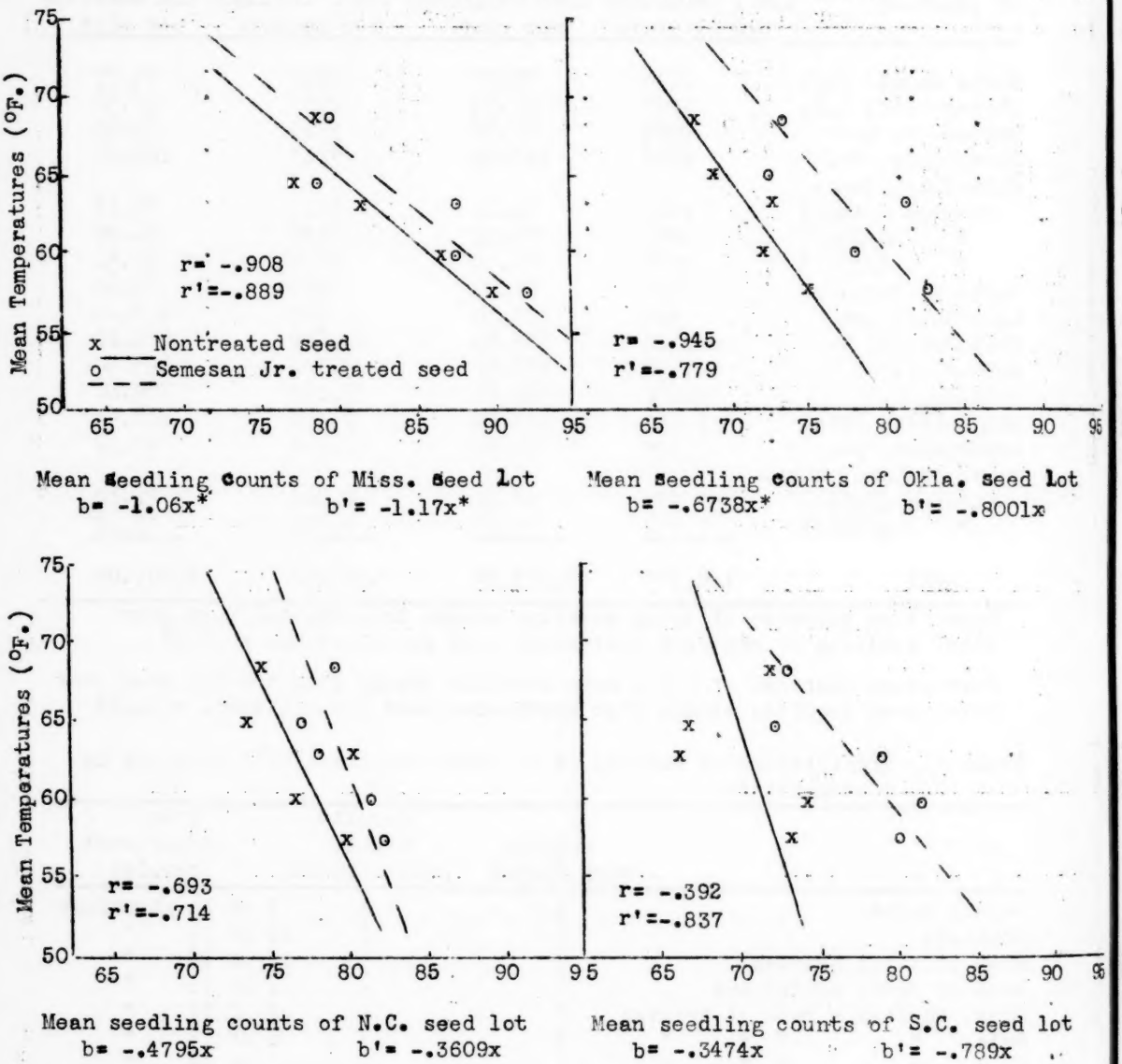
Percentage increase of total seedling stands from treated seed over total seedling stands from nontreated seed for all tests = 3.28%

Percentage increase of total mean seedling stands from treated seed over total mean seedling stands from nontreated seed for all tests = 3.68%

Table 3. Significance of results of 16 tests planted in 13 locations by 9 cooperators.

	Results significant	Results highly significant	Total significant results
Replications	1	6	7 of 16 plantings
Seedlots	4	8	12 of 16 "
Mean of total treated	6	5	11 of 16 "
Mean of total nontreated	1	-	1 of 16 "
Miss. seedlot - mean of treated	2	-	2 of 15 "
Okla. " " " "	3	3	6 of 15 "
N. C. " " " "	4	-	4 of 15 "
S. C. " " " "	4	1	5 of 15 "
Va. " " " "	1	2	3 of 15 "
Tenn. " " " "	2	-	2 of 15 "
Ark. " " " "	2	1	3 of 16 "
Lot 8 " " " "	-	-	0 of 5 "

Fig. 1. Relationship between mean air temperatures and seedling stands.



Mean seedling counts of Miss. seed lot
b= -1.06x* b'= -1.17x*

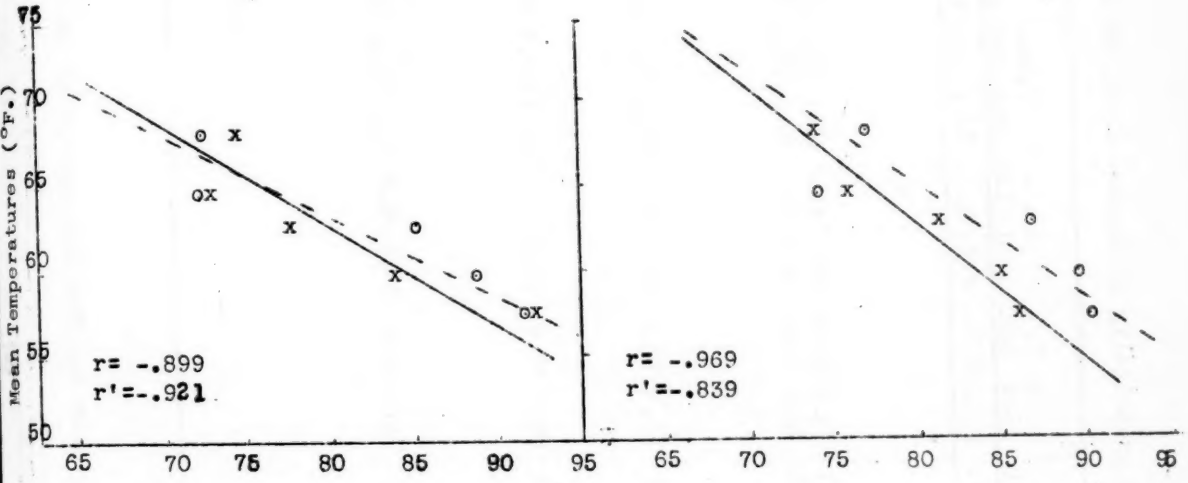
Mean seedling counts of Okla. seed lot
b= -.6738x* b'= -.8001x

Mean seedling counts of N.C. seed lot
b= -.4795x b'= -.3609x

Mean seedling counts of S.C. seed lot
b= -.3474x b'= -.789x

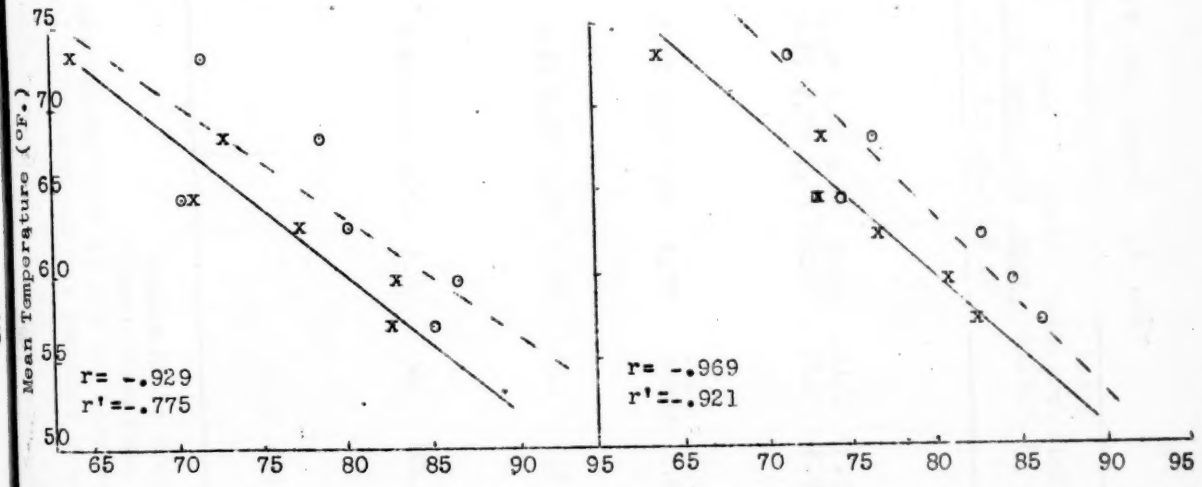
___ regression line of seedling stands from nontreated seed
---regression line of seedling stands from Semesan Jr. treated seed
r correlation coefficient of stands from nontreated seed
r' correlation coefficient of stands from Semesan Jr. treated seed
b regression coefficient of stands from nontreated seed
b' regression coefficient of stands from Semesan Jr. treated seed
* significant at (.05)
** significant at (.01)

Fig. 1. (cont.)



Mean seedling counts of Va. seed lot
b= -1.6284x* b'= -1.9885*

Mean seedling counts of Tenn. seed lot
b= -1.1857x** b'= -1.4367x



Mean seedling counts of Ark. seed lot
b= -1.2067x** b'= -1.426x*

Mean total seedling counts of all seed lots
b= -1.1256x** b'= -.9532x**

Table 4. A-test data represented graphically in figures 1, 2, and 3.

Location of Planting	Mean Temp.	Soil pH	Total Precipitation	Miss. seed lot		Okla. seed lot		N. C. seed lot		S. C. seed lot		Va. seed lot		Tenn. seed lot		Ark. seed lot		Mean totals for all lots	
				N. T.	S.J.	N.T.	S.J.	N.T.	S.J.	N.T.	S.J.	N.T.	S.J.	N.T.	S.J.	N.T.	S.J.	N.T.	S.J.
Knoxville, Tenn. Planted:																			
4/16	57.25	5.3	2.46	89.3	91.8	75.3	82.3	79.8	82.3	73.3	80.0	92.0	91.8	86.0	90.0	83.0	85.3	82.6	86.2
4/29	68.38	5.3	.25	79.0	79.5	67.5	73.5	74.3	79.3	72.0	72.8	74.8	72.0	74.0	77.0	73.0	78.5	73.5	76.1
Stillwater, Okla. Planted:																			
4/16	64.54	5.5	trace	77.5	78.9	69.4	72.6	73.9	77.2	66.9	72.2	73.0	72.5	75.9	74.3	70.9	70.7	73.1	74.5
Jackson, Tenn. Planted: 4/21	62.92	?	.23	82.2	87.7	72.8	81.2	80.2	78.2	66.2	78.8	77.8	85.3	81.3	86.7	77.2	80.5	76.8	82.6
Blacksburg, Va. Planted:																			
4/29	59.92	4.88	.22	86.5	87.4	72.3	78.0	76.8	81.5	74.5	81.4	83.9	88.6	84.6	89.4	83.4	86.9	81.0	84.8
Clarkdale, Ark. Planted:																			
5/1	73.42	6.55	2.56													63.7	71.5	63.7	71.5

N.T. - Nontreated mean stand counts
S.J. - Semesan Jr. mean stand counts
Mean temperature calculated for the 12 days immediately following planting from the average of the daily maximum and minimum temperatures recorded for the particular location.

Leg

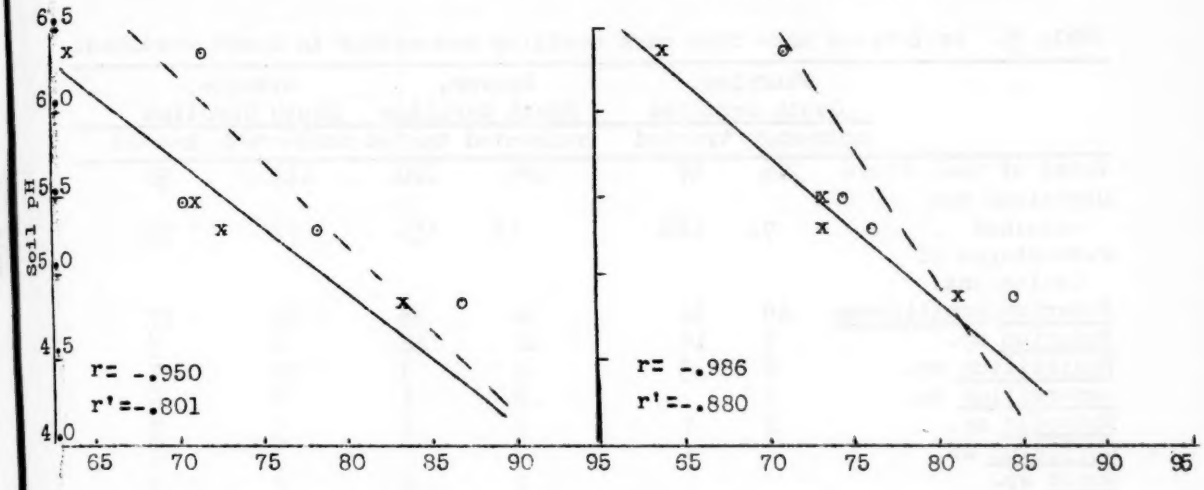
Fig

Leg

Mea

Soil pH

Fig. 2. Relationship between soil pH and seedling stands

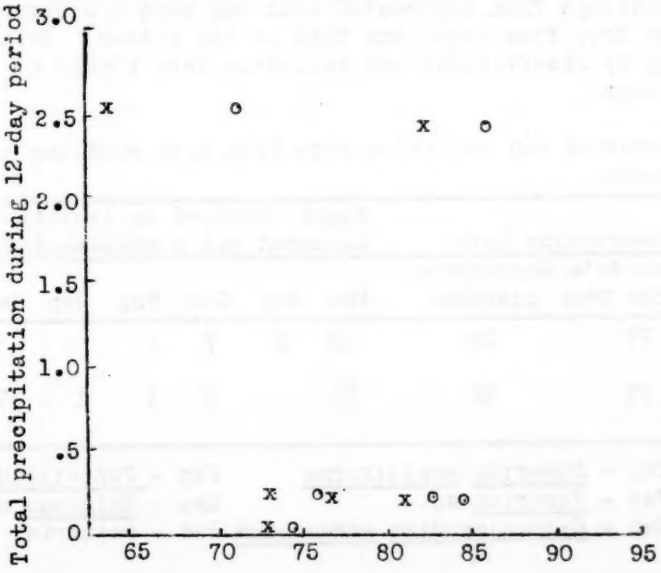


Mean seedling counts of Ark. seed lot
b= -12.5074x* b'= -9.686x

Mean total seedling counts of all seed lots
b= -11.299x* b'= -8.1273x

Legend as in Fig. 1.

Fig. 3. Relationship between total precipitation and seedling stands



Mean total seedling counts of all seed lots

Legend as in Fig. 1.

minimum temperatures recorded for the particular location.

Isolation data: C. H. Arndt, of South Carolina, reported isolating fungi from seedlings as follows:

Table 5. Isolations made from corn seedling mesocotyls in South Carolina.

	Fairplay, South Carolina		Denver, South Carolina		Sixmile, South Carolina	
	nontreated	treated	nontreated	treated	nontreated	treated
Total of isolations	116	67	125	100	111	98
Organisms not obtained	7%	18%	7%	15%	7%	7%
Percentages of isolations:						
Fusarium moniliforme	49	34	50	33	55	27
Fusarium sp.	5	19	11	14	2	3
Penicillium sp.	2	5	.4	3	25	47
Aspergillus sp.	3		.8	1	8	6
Rhizopus sp.	2	1	2	2	3	3
Corticium sp.		3				1
Mucor sp.			.2	2	2	3
Cephalosporium acremonium	5		.8	2	6	
Bacterial contaminants	13	19	12	16	19	11

These data show that mesocotyls from seedlings produced from seed treated with Semesan Jr. were infected with Fusarium moniliforme to a lesser degree than seedlings from nontreated seed and that a greater number of the former were free from organisms than of the latter. This is shown even more strikingly by observations and isolation data (Table 6) from the Oklahoma plantings.

Table 6. Observation and isolation data from corn seedling mesocotyls in Oklahoma.

	Observation Data		Fungi obtained by isolations made from diseased and nondiseased mesocotyl tissue						
Seedlings from:	Mesocotyls disease free	Mesocotyls diseased	Fmo	Fsp	Cac	Psp	Rsp	Bac	Organisms not obtained
Treated seed	77	22	12	2	7	1		3	69
Nontreated seed	25	92	86		2	3	2	7	24

Fmo - Fusarium moniliforme
Fsp - Fusarium sp.
Cac - Cephalosporium acremonium
Psp - Penicillium sp.
Rsp - Rhizopus sp.
Bac - Bacteria

The diseased and nondiseased mesocotyls were easily separable, so much so that other workers in the laboratory could separate the seedlings from treated and nontreated seed after a brief examination. These seedlings

were obtained at random from the planting when they were 4 to 5 inches in height.

Arndt, in 3 locations, also found numerous seedlings with discolored bases (brown to black in color) from which he reported the following data:

Table 7. Total bases discolored and percentages of discolored bases plated that were infected by the several fungi.

	Number seedlings examined	Percentage bases discolored	Fmo	Fsp	Psp	Rz	Bac	Organisms not obtained
Nontreated	525	19	34	5	7	10	21	12
Treated	500	20	38	8	9	8	18	11

Fmo - Fusarium moniliforme
Fsp - Fusarium sp.
Psp - Penicillium sp.
Rz. - Rhizopus sp.
Bac - Bacteria

Other organisms occasionally obtained by Arndt from seedlings included a yellow bacterium, Mucor sp., Macrophomina phaseoli (= Sclerotium batatícola), Trichoderma sp., Chaetomium sp., and several fungi which did not form spores.

From A-test plantings in Tennessee, Fusarium moniliforme was isolated 46 times, Cephalosporium acremonium 3 times, Helminthosporium sp. once, and Chaetomium sp. once. Fusarium moniliforme was isolated 18 times from seedlings from treated seed and 28 times from seedlings from nontreated seed.

Young, of Mississippi, reported isolating species of Aspergillus, Penicillium, Fusarium, and Rhizopus in that order of prevalence. One isolate of Diplodia zeae was obtained. Apparently no differences in infection were noted between seedlings from treated seed and those from nontreated seed.

Hyre, in Tennessee, observed Diplodia ear-rots in an A-test planting (Table 8) in which earlier plantings were more diseased than later plantings.

Table 8. Presence of Diplodia ear rot in plantings of corn made on different dates, also on plants grown from treated and nontreated seed.

Planting date	Diplodia ear rot %
April 16	5.2
April 29	3.5
May 20	1.0

Seed treatment	Diplodia ear rot %
Untreated	3.4
Semesan Jr.	3.1

Table 9. Numbers of seedlings obtained from treated and nontreated seed in the B-test.

Location	Nontreated		Semesan Jr.		Spergon		Barbak-D		Arasan		1451-D	
	Total	Mean	Total	Mean	Total	Mean	Total	Mean	Total	Mean	Total	Mean
Stillwater, Okla.												
Planted 4/19/43	2123	70.77	2365	78.83	2356	78.56	2273	75.77	2335	77.83	2426	80.87
6/ 4/43	1252	83.47	1248	83.20	1282	85.47	1253	83.53	1258	83.87	1297	86.47
Jackson, Tenn.	1265	42.17	1329	44.30	1330	44.33	1317	43.90	1337	44.57	1318	43.93
Knoxville, Tenn.	2395	79.83	2458	81.90	2448	81.60	2512	83.73	2498	83.27	2505	83.50
Blacksburg, Va.	2378	79.27	2438	81.27	2451	81.70	2298	76.60	2332	77.73	2397	79.90
Fairplay, S. C.	13,164	82.30			13,685	85.53	13,075	81.72	13,400	83.75		
Denver, S. C.	10,531	65.82			10,597	66.23	10,597	67.05	10, 542	65.89		
Clarkdale, Ark.	1622	135.17	1583	131.92	1645	137.08	1726	143.83	1738	144.83	1716	143.00
Experiment, Ga.	2578	85.93	2710	90.33	2813	93.77	2718	90.16	2869	95.63	2814	93.80
State College, Miss.												
Planted 4/14/43	823	41.15	841	42.05	855	43.75	851	42.55	864	43.20	817	40.85
5/20/43	870	43.50	896	44.80	908	45.40	871	43.55	859	42.95	887	44.35
Totals (without S. C. data)	15,306	661.16	15,868	678.60	16,088	690.63	15,819	684.06	16,090	693.88	16,177	696.67
Percentage total increase of treated over nontreated			3.67%		5.11%		3.35%		5.12%		5.69%	
Percentage mean increase of treated over nontreated				2.64%		4.46%		3.46%		4.95%		5.37%

II. B-test data. Comparison of seed corn treatments with different chemicals.

Seedling stand data: In Table 9, the total numbers of seedlings obtained from both the treated and nontreated seed by each cooperator are listed as to location of planting and treatment. It is interesting to note that each of the 5 chemicals used in the tests produced a greater number of seedlings than the nontreated.

In Table 10 are shown the percentages by which seedling stands from treated seed were greater than those from nontreated seed (75% of the total number of plots in all of the tests planted).

Table 10. Percentages of seedling stands from treated seed that were greater than those from nontreated seed.

	Total	Percentage seedling stands increased over nontreated	Percentage seedling stands significantly increased	Percentage seedling stands highly significantly increased	Percentage total plots significantly & highly significantly increased
All plots	304		6.91	3.95	10.86
Treated plots	249	75.5	8.03	4.82	12.85
Nontreated plots	55		1.82		1.82
Semesan Jr.	45	71.11	6.67	4.44	11.11
Spergon	53	84.91	7.55	3.77	11.32
Arasan	53	73.58	9.43	5.66	15.09
Barbak-D	53	67.92	5.66	3.77	9.43
1451-D	45	80.00	11.11	6.67	17.78

Yield data were obtained from the B-test plantings in Mississippi and South Carolina; however, there were no significant differences obtained between the different treatments and the nontreated plots.

At the Oklahoma station isolations were made from the mesocotyls of 100 seedlings of each treatment including the nontreated. The seedlings were obtained at 8 weeks of age at which time they were 12 to 18 inches in height.

Table 11. Comparison of number of isolates of various organisms obtained from seedlings of each of the treatments in the B-test at Stillwater, Oklahoma

Treatment	Number plated	Organisms not obtained	Fmo	Cac	Rhi	Psp	Fsp	Bac	Hel	Dze	unidentified
Nontreated	100	4	83	2	3	3		2			3
Semesan Jr.	100	21	47	5	7	5	2	5	1	5	2
Spergon	100	17	50	9	13	3	3	3			2
Arasan	100	15	61	8	2	1	4	2		2	5
Barbak-D	100	16	30	9	13	11	5	2	1		13
1451-D	100	23	47	1	5	7	3	6	1	1	6

Fmo - *Fusarium moniliforme* Rhi - *Rhinotrichum* sp. Fsp - *Fusarium* sp.
Cac - *Cephalosporium acremonium* Psp - *Penicillium* sp. Bac - Bacteria
Hel - *Helminthosporium* sp. Dze - *Diplodia zeae*

It is interesting to note that here again the seedlings grown from nontreated seed were more heavily infested with Fusarium moniliforme than were seedlings of any of the treatments.

III. Rates of application tests: Eight different chemicals were applied to small individual samples of the Tennessee seed lot at rates of 1 1/2, 3/4, and 3/8 ounces of dust per bushel of seed. The 8 chemicals used in this test were: (1) Semesan Jr., (2) Spergon, (3) Dubay 1451-D, (4) Merno, (5) Barbak-D, (6) Dow #5, (7) Arasan, and (8) AMAC-118.5-C.

Analysis of the seedling count data showed the 1-1/2 and 3/4 ounce rates of application as highly significant over a nontreated check and the 3/8 ounce rate as significant over the check. There were no significant differences between the 3 rates of application of the chemicals. Of the 8 chemicals used in the test, only Semesan Jr., Spergon, 1451-D, and Merko significantly increased the seedling stands as compared with the nontreated check.

Cooperators of the Southern Cooperative Corn Disease Research Committee in 1943

S. A. Wingard	Blacksburg, Va.	F. D. Richey	Knoxville, Tenn.
S. G. Lehman	Raleigh, N. C.	James Epps	Jackson, Tenn.
C. H. Arndt	Clemson, S. C.	G. Y. Young	State College, Mass.
U. R. Gore and		R. C. Eckhardt	State College, "
G. A. Lebedeff	Experiment, Ga.	I. L. Forbes	Baton Rouge, La.
W. A. Freeman	Tifton, Ga.	E. M. Cralley	Fayetteville, Ark.
R. A. Hyre	Knoxville, Tenn.	J. H. McLaughlin	Stillwater, Okla.

SOUTHERN COOPERATIVE CORN DISEASE RESEARCH COMMITTEE

STEM ANTHRACNOSE AND RED ROT OF SORGO IN MISSISSIPPI

M. L. Lohman and I. E. Stokes

In the experimental culture of sorgo during the past four years at the U. S. Sugar Plant Field Station, near Meridian, Colletotrichum stem rot has caused important losses only in 1940 and 1943. In 1940, when the disease was first observed, only a general appraisal of damage could be made. Plantings in 1941 showed incipient stages of rot in peduncles and overmature stems; but macroscopic signs of anthracnose were not observed, and culture platings were negative except in the case of those made from diseased peduncles. Plantings in 1942, consisting of a larger number of varieties and occupying a considerably larger area, were generally infected but were damaged only to the extent of trace losses in late maturing sorgos, as estimated with respect to stem lesions, breakage, and incidence of late stages of rot. Concurrently, serious Colletotrichum damage

to broomcorn occurred in Illinois[1]. In 1943, at Meridian, damage was serious or threatening in several fields and in a number of experimental plots, particularly in nurseries and some of the tests that involved mid-season and late maturing varieties and hybrids. Manifestations of the development of the disease in individual stems, as observed in systematic plot surveys in 1942 and 1943 and in the inoculation blocks in 1943, in some respects differ decidedly from the Illinois stem rot of broomcorn. The seasons in which important losses have occurred have had a similar trend in growing conditions. It is of interest to note that a similar trend prevailed in Illinois in 1942[2], and that a more or less reverse trend prevailed at Meridian in years of little or no damage. The causal fungus, culturally and morphologically, is very similar to C. falcatum Went, but it cannot be positively identified until comparisons of it with isolates of Colletotrichum from other grass hosts have been completed.

This note is concerned with the general features of the disease, largely as observed in the past 2 years, and with seasonal aspects in relation to incidence and damage as they may point out possible etiological factors. Control practices are not discussed although it is obvious that if the relationships between seasonal aspects and damage are proved, losses due to late harvesting of the more susceptible varieties in theoretically potential "anthracnose or red-rot years" can be avoided.

Discoloration, Anthracnose, and Rot Phases. In the past 2 years it has been possible to give greater attention to this stem disease as a part of the work on diseases that may increase in importance as the culture of sorgo is expanded. Experimental plots have been sampled at harvest, and incidence of discoloration, anthracnose, and advanced stages of rot have been determined. In 1942 stem tissue platings were made from sample internodes and peduncles for 13 selected varieties. Although the majority of these unit samples were without macroscopic signs of infection and half of them without discoloration, the presence of Colletotrichum was demonstrated for 10 of the varieties, with positive tests for 22 of 49 internodes and 7 of 9 peduncles. In 1943 rot and anthracnose were obtained following the artificial inoculation of stems. Advanced stages of rot involving as many as 5 internodes from the point of inoculation were present in one test at the early flowering stage of maturity within a period of 3 weeks from the time of inoculation. In all tests involving stem inoculations, with adequate controls for the technics employed, the rot was observed regularly and the pathogenicity of isolates from both sorgo and sugarcane was evident. Major aspects of the disease in the stem are, in general, the same as those which have been described for red rot in sugarcane[3]. These are internal discoloration, bars of mottling, cortical

---

1 Koehler, B. Ill. Agric. Expt. Station, Department of Agronomy Circular (unnumbered). January, 1943; also PDR 27(2):70-73 Feb. 1, 1943.

2 PDR 27(9): 209-218. 1943.

3 Abbott, E. V. U. S. Dept. Agri. Techn. Bull. 641. 1938.

anthracnose, and rot. The anthracnose stage in sorgo, however, typically develops to the extent that it can be used conveniently in estimating red-rot susceptibility.

Discoloration, only yellowish or orange-colored, as in Leoti, decidedly reddish in most varieties but reddish-brown, brownish, or deep reddish-purple in others, is an atrribute of the host and results from reactions of living tissue to stimulants among which Colletotrichum infection appears to be paramount. (It is possible that there will be found susceptible sorghums which lack the potentiality for discoloration). Paradoxically, small areas of living tissue of normal color (later showing as bars, mottling, or pockets in the discolored tissue), on becoming densely and rapidly invaded by the fungus and killed, discolor only faintly yellowish, grayish, or bluish, if at all. The resultant internal symptoms as seen in medial split sections of internodes are scattered flecks and spots, axial, cortical, or intermediate streaks, subcortical diffused blotches, or total discoloration, the 2 latter with or without areas faintly discolored, or of normal appearance, interspersed as crosswise bars, mottled aspects, or cortical lens-shaped to short cylindric pockets. Discoloration is a fair index of infection; and discoloration with bars, an unquestionable symptom.

Anthracnose lesions may appear first on the peduncle or any stem internode, depending apparently upon time and locus of infection, texture and maturity of stems, and strain of the pathogen. They develop from mycelium in pockets and bars. On unsheathed surfaces, once the lesions are fruiting and not complex, they appear as linear or elliptic, smooth or sunken, brownish or black areas, dark because of the abundance of setae and occasional masses of fungous tissue. Beneath the sheath they appear as salmon-colored, slimy areas. In plants inoculated at the heading stage with a single point of inoculum at midstem, under the conditions of some tests both types of lesions formed by the fifth week, usually above the inoculation point and in the case of the more virulent cultures 1 to 5 internodes above it. Generally, anthracnose lesions are preceded by discolored streaks on the surface; yet surface discolorations do not necessarily signify incipient lesions, the presence of pockets or bars, or even internal discoloration. Lesions in the lower half of the stem before the milk stage of maturity are signs of established infections likely to result in high incidence of rot and serious stem breakage in the hard dough and ripe stages. Abundant early lesions in the upper internodes, irrespective of peduncle infection, can result in mature heads of light weight because of abnormally small kernels.

Rot in its incipient stages may appear watery or dull and aside from discoloration and tastelessness is not recognizable. In advanced stages, with or without the presence of bars and surface lesions, tissues usually appear shrunken, dull and dry; they taste of mold, and are discolored, as noted above, according to the variety. With high humidity and sufficient internal moisture wefts of mycelium are conspicuous in the cavities that result from deterioration as well as in those that are formed otherwise in large stems of rapid growth. In final stages nodal tissues frequently are rotted, internodes are shrunken, and stems break over, in general immediately above the node in one or more weakened areas. The lowermost internodes near to and below the soil line are typically free from disease, and crowns

and roots are normal.

Rot in a particular stem may develop from one or a number of independent infections which are presumably through the cortex in the lower portion of the internodes. Subsequent progress is largely upward. Blade and midrib anthracnose undoubtedly supplies the bulk of potential inoculum for the infections.

Seasonal and Crop Conditions in Relation to Damage. Growing conditions in the red-rot years, 1940 and 1943, were favorable for most of the sorgos, but in the intervening years they were adverse, especially for early and midseason varieties. The vegetative periods, as indicated in Table 1, were moist in contrast to the droughty conditions of 1941 and

Table 1. Rainfall and temperature departures from the normal for periods or phases in sorgo culture, in the comparison of years (1940, 1943) of red rot with the intervening years of little damage.[a]

Crop culture periods	Rainfall (inches)				Temperature (°F.)			
	1940	1943	1941	1942	1940	1943	1941	1942
January through March	-1.19	-3.10	-6.86	-0.96	----	----	----	---
Early growth	+0.22[b]	-1.68	-3.37	-4.21	-1.2	+2.9	+2.0	+1.3
Late growth to heading	+12.24[b]	+3.15[b]	+1.02	-4.08	-1.9	+4.0	+1.5	+0.9
Heading to maturity	-4.54	-3.02	-1.59	-1.36	+1.3	+3.1	+1.4	0
After-ripe (1 month)	-2.05	+1.25	-0.61	+2.98	-1.7	+2.8	+5.4	-1.3

[a] Departures in rainfall and temperature from the normal (42 and 41 year averages, respectively, for Meridian) are calculated from precipitation records on the Station farm and temperature records of the United States Weather Bureau in Meridian. Yearly adjustments for culture periods are on the basis of mean heading date in early April plantings of the midseason variety, Rex. Except as otherwise indicated, total daily precipitations involved from planting to maturity are less than 2 inches.

[b] There is included one total daily rainfall of 2 to 2.5 inches.

1942. However, with regard to early April plantings of midseason varieties, prolonged warm dry weather began shortly after heading; and rot developed rapidly. In some early April plantings of late and mid-late varieties in 1943, occasional mainstems or tillers died in the boot stage; some rows were highly infected in the dough stage, with stem breakage showing up, and at maturity showed up to 50% breakage with the standing stems badly rotted. Less susceptible, early and midseason varieties showed only light to moderate incidence when ripe, but in unharvested rows were heavily rotted within the next 2 weeks. In 1942, late sorgos were favored with moisture during late growth, heading and flowering stages -- equivalent to heading to maturity phase and a week beyond for the midseason variety Rex (Red X). These, as previously mentioned, showed traces of damage. The late seasonal trend that affected them is the same as the earlier trend in 1940 and 1943.

It appears that moist periods furnish a rapid increase in potential inoculum and produce a more succulent host tissue, especially when warm, which results in increased infection and development of rot. Also, that when moist periods are followed by drought, conditions are not only adverse to the plants but favorable to the rapid advance of rot, which in the more susceptible varieties proceeds from all stages of infection to the point of stem breakage within a few weeks. Losses due to stem breakage, of course, are apparent and readily estimated; whereas those due to reductions in yield and quality of juice in relation to estimates of incipient and advancing rot, can be determined only with continued experimentation. It is believed that in some varieties, otherwise desirable, such losses are substantial.

Distribution in Mississippi in 1943. A field survey of the occurrence of red rot in the State, following the first indications of damage, locally, could not be made. However, red rot was negligible in cooperative experimental plantings at State College and at Holly Springs. In traveling to Holly Springs on October 22 and 23, the disease was noted at 11 of 17 points of inspection (9 of 10 counties) for one or more fields of Hodo[4], Honey, Sugar Drip, Sumac, and Texas Seeded Ribbon. Highest incidence occurred in the region to the east of the northern central belt of prolonged spring and summer drought, with advanced stages of rot and an average of 10% stem breakage in 2 fields of immature Hodo in Noxubee County and in 1 field of immature sorgo (probably Sugar Drip) in Lowndes County. Throughout the area sorgos had been heavily frosted the preceding week. No doubt rot advanced to some extent following frost injury. However, at Meridian the sirup varieties Hodo, Honey, Honey Dew Drip[4], and Sugar Drip have shown high susceptibility.

UNITED STATES SUGAR PLANT FIELD STATION, DIVISION OF SUGAR PLANT INVESTIGATIONS, BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING, AGRICULTURAL RESEARCH ADMINISTRATION, U. S. DEPARTMENT OF AGRICULTURE, MERIDIAN, MISSISSIPPI.

---

[4] This is a commercial sirup variety in Mississippi.

DIAPORTHE SOJAE ON COWPEAS

Leland Shanor and Carlton F. Taylor

As far as we have been able to determine, the organism causing stem and pod blight of soybeans (Soja max) has not been reported previously on cowpeas (Vigna sinensis). Therefore the finding of this pathogen on cowpeas, in a field of approximately one acre, about 2 miles south of Holland, Virginia, should be on record. This field had been planted to soybeans in 1942 and was adjacent to a field of soybeans in 1943. The soil in this field is not particularly fertile.

When visited on October 15, 1943, the crop in this field had been severely injured by stem and leaf parasites and by wilt and was in rather poor condition. Although the plants were far past maturity, it was noted that most of the leaves remaining on them possessed spots caused by the fungus commonly identified as Amerosporium oeconomicum. Approximately one-fourth of the stems in this field bore characteristic light-colored encircling areas, in which were scattered numerous black pycnidia. The appearance of these stem symptoms were so strikingly like those caused by the pycnidial stage of Diaporthe sojae Leh. on soybean that this organism was suspected of being the cause of the stem blight of these cowpeas. A careful study of the samples collected from this field and a comparison of them with soybean stems parasitized by Diaporthe sojae Leh. which are in the Mycological Collection of the Bureau of Plant Industry, supported this diagnosis. On cowpea stems, pycnidia develop in greyish necrotic areas and form in a more or less linear fashion just as they do on soybean. Measurements of spores and of pycnidia correspond to those of similar structures taken from infected soybean stems. Pod infections have not been found on any of the specimens examined. Although the fungus on cowpea appears to be morphologically identical with the one commonly occurring on soybean, there may be physiological differences in their pathological behavior.

The diseased cowpea specimens collected from Virginia have been examined also by Dr. C. L. Lefebvre of the Division of Forage Crops and Diseases, Bureau of Plant Industry, who concurs in the identification of the causal organism as the pycnidial stage of Diaporthe sojae Leh. He has also made single spore isolations from these specimens and his cultures of the cowpea pathogen appear to be identical with those recently isolated from infected soybean stems.

Specimens on which these observations were made have been deposited in the Mycological Collection of the Division of Mycology & Plant Disease Survey, at Beltsville, Maryland.

EMERGENCY PLANT DISEASE PREVENTION PROJECT

SHORTER NOTES ON SOME NEWLY RECORDED DISEASES

EVIDENCE OF BORON DEFICIENCY OBSERVED ON APPLES IN NEW JERSEY: In 1941 (August) and 1942 the writers observed what appeared to be boron deficiency symptoms on Duchess and McIntosh apple trees in Hawthorn, Passaic

County, New Jersey. Since boron deficiency in apples has not previously been reported as occurring in this state, the reporting of its presence is considered advisable.

The evidences of boron deficiency, as expressed by the Duchess variety, were the fruit symptoms drought spot and internal cork. The fruit produced by McIntosh apples in the orchard in question appeared normal, but rosetting was common on spurs and twigs. -- Eldrow Reeve and Robert H. Daines, New Jersey Agricultural Experiment Station, New Brunswick.

PENICILLIUM GLADICLI ISOLATED FROM YAM: A diseased yam (Dioscorea sp.) from Cuba found in ships stores by inspectors of the Bureau of Entomology and Plant Quarantine was given to the writer to be examined for nematode infestation. The color was typical of tissue infested with the meadow nematode, Pratylenchus pratensis (de Man) Filipjev. The brownish red discolored region was, however, in the heart of the yam, and not as in nematode injury near the surface. No nematodes were found but many small light colored sclerotia were present. These were distributed through the discolored tissue in little clusters and singly. In culture the sclerotia yielded a Penicillium which differed from P. gladioli only in the production of fewer sclerotia rather tardily on agar. Through John A. Stevenson a culture was sent to Dr. Kenneth B. Raper who verified the determination as a form of Penicillium gladioli L. McC. & Thom. -- Donald P. Limber, Division of Foreign Plant Quarantines, Bureau of Entomology and Plant Quarantine, Agricultural Research Administration, U. S. Department of Agriculture.

THE SEASONAL SPREAD AND DEVELOPMENT OF CUCURBIT DOWNY MILDEW IN THE ATLANTIC COASTAL STATES

C. J. Nusbaum

Downy mildew (Peronoplasmopara cubensis) [Pseudoperonospora] occurs nearly every year on various cucurbit crops in the Atlantic Coastal States. Whether or not the disease becomes destructive depends largely upon the time it appears in relation to the time of harvest and upon weather conditions following its establishment. If a preharvest appearance is followed by cool to moderate temperatures and adequate moisture, either in the form of rains or heavy dews, mildew may spread quickly and cause heavy losses. However, if the disease is late in appearance or if weather conditions are unfavorable, the crop may escape serious damage. These facts have been reported by a number of investigators and are borne out by seasonal records on the epidemiology of downy mildew in the central part of South Carolina since 1936. In this area, the disease usually appears early in June at about the beginning of cucumber harvest. The earliest appearance was observed on May 21 (1939) and the latest on June 20 (1941). It has been destructive on cucumbers or cantaloupes in only 4 of the past 8 years.

Seasonal variations in the time of appearance of cucurbit downy mildew

and its development in States along the Atlantic seaboard have given rise to considerable speculation regarding the source of primary infection. Doran[1] and Van Haltern[2] have presented strong circumstantial evidence in support of the view that the disease overwinters in the frost-free areas in Florida and spreads northward each year with the advancing season by means of wind-borne spores. If this is true, as many investigators now believe, information concerning the development of mildew in Florida and its journey northward would be of significant value to agricultural workers and growers interested in the production of susceptible curcurbit crops. If the time of arrival of this disease in a commercial producing area could be predicted with reasonable accuracy, it would facilitate the use and proper timing of control measures. With this in mind and also to gain further evidence as to the validity of the above hypothesis, several workers from Florida to Massachusetts have cooperated in a cucurbit downy mildew reporting service since 1941. In this year, reports were assembled and distributed by Dr. J. G. Horsfall of the Connecticut Agricultural Experiment Station. In 1942 and 1943 this work was continued by the writer. A summary of all 1943 reports is given below.

Florida. Mildew was present on cucumbers at about the usual time but its development during April was checked by a prolonged drouth. Nevertheless, the disease was widespread in central Florida by late April and early May although sporulation had been light up to that time. The drouth was broken on May 8 and heavy rains followed. Mildew developed abundantly on abandoned fields during May. Losses were apparently light.--A. N. Brooks and G. F. Weber.

South Carolina (Charleston). Downy mildew was first observed on June 1 on cucumbers, coincident with the beginning of the harvest season. This indicated that the first infections occurred during a rainy period from May 24 to 26. Although the disease appeared at about the usual time, its development was checked for about 10 days by unfavorable weather conditions. After June 10, when favorable conditions returned, mildew spread rapidly. Undusted cucumbers were damaged considerably during the latter part of the harvest season. Plants in most fields were dead by June 21. Downy mildew appeared on cantaloup, watermelon, and squash (African, Hubbard, and Table Queen) about 10 days later than on cucumbers and caused heavy defoliation late in the season. -- C. N. Clayton

South Carolina (Blackville). Downy mildew was first observed on cucumbers on June 15, about a week later than usual. Late May and early June

---

[1] Doran, W. L. Downy mildew of cucumbers. Massachusetts Agr. Exp. Sta. Bull. 283, 1932.

[2] Van Haltern, Frank. Spraying cantaloupes for the control of downy mildew and other diseases. Georgia Exp. Sta. Bull. 175, 1933.

were hot and dry. Scattered showers and heavy dews occurred after June 9 but the drouth was not broken generally until June 15. The first infections probably occurred in a few fields during the humid nights of June 9 or 10. After establishment, conditions were favorable and the disease spread rapidly. Cucumber harvest had been under way for 2 weeks when mildew first appeared and this crop escaped serious damage. Cantaloups, on which mildew was first observed on June 22, suffered throughout the harvest period. Yields were reduced about 25% and quality was impaired by early defoliation. Most fields had collapsed by July 7, about 12 days after harvest began.

It is worthy of note that downy mildew infection failed to take place in the Blackville area during the wet period of May 22 to 24 when it presumably was initiated at Charleston, 100 miles to the southeast. This suggests that, during this favorable period, inoculum was present at Charleston but not at Blackville. Therefore, establishment at Blackville awaited the next favorable period beginning about June 9. This circumstantial evidence supports the view that wind-borne spores are responsible for primary infection. -- C. J. Nusbaum.

North Carolina. The first infection was observed on cucumbers in the Laurinburg area on June 30, a little later than usual. The disease probably became established during the favorable period of June 23 to 25. Prior to this, June weather was hot and dry. When mildew was first observed, cucumber harvest was over and cantaloup harvest was just beginning. In early July, conditions were favorable and the disease spread rapidly. Cantaloups suffered damage late in the harvest season.--D. E. Ellis.

Virginia. Downy mildew appeared simultaneously over a wide area in the Tidewater district at about the usual time. It was first found on July 26. Early July was hot and humid but a cool spell occurred from the 19th to the 23d, when the initial infections probably took place. Only watermelons and late plantings of cantaloups suffered to any appreciable extent. August was hot and somewhat dry but dews were sufficient to support sporulation.-- R. P. Porter.

Delaware. Infection was probably initiated during a favorable period, July 10 to 12. It was first noted on cucumbers on July 19, about the usual time. By July 23, mildew was developing abundantly in some fields. After the disease became established, weather conditions were generally unfavorable. Losses were very light. -- J. W. Heuberger.

Connecticut. Downy mildew appeared about August 1, a little earlier than usual. Dry weather preceded the first observance of the disease and conditions thereafter did not appear to be favorable for its development. Nevertheless, the disease became destructive on some cucurbit crops. -- J. G. Horsfall.

Massachusetts. Downy mildew probably became established in Plymouth and Bristol Counties between August 25 and September 1 and about a week later at Amherst. The disease was 8 to 10 days later than usual. In Plymouth

and Bristol Counties, conditions were favorable for infection between August 12 and 15 and again from August 27 to 31. The disease probably started during the later period although the earlier one may have been concerned. The wet period of August 27 to 29 was probably responsible for the establishment of the disease at Amherst because mildew failed to appear after the favorable period of August 10 to 14. Following the first appearance, conditions were favorable and the disease developed abundantly. None of the early crops was damaged but late cucumbers showed 25 to 90% loss and late summer squash showed losses from a trace to 25%.

An analysis of weather conditions and downy mildew development in Massachusetts is of interest. In the southeastern part of the State it was too warm and dry during July and early August for the disease to develop. However, in the western part (Berkshire, Hampshire, and Franklin Counties) conditions were favorable throughout July and August. Nevertheless, mildew appeared suddenly in the southeastern section and soon afterwards farther inland and westward. This suggests that either spores of the fungus did not reach the western part until late August, or that it did not overwinter there. If inoculum was present in the southeastern part, either overwintered or wind-borne, the establishment of the disease there awaited the onset of cool, damp conditions after mid-August. -- O. C. Boyd.

A summary of the 1943 season's reports shows that cucurbit downy mildew was present on crops in Florida at the usual time but a dry April delayed the development of the disease; it appeared at about the usual time in South Carolina where it caused considerable damage; in North Carolina and the Middle Atlantic States mildew appeared on time but it was not generally serious, largely because of unfavorable conditions; in the New England States the disease caused heavy losses on late crops. On the whole, 1943 was what might be called an average season. Downy mildew appeared throughout the Atlantic region and its destructiveness appeared to be governed by local weather conditions.

The writer wishes to thank those who sent in reports. Other workers, who have occasion to follow the development of downy mildew in their own localities are invited to cooperate. Furthermore, those interested may receive future reports by sending their names and addresses to the writer before May 1944.

EDISTO EXPERIMENT STATION, BLACKVILLE, SOUTH CAROLINA

NEMATODE SURVEY IN FLORIDA

A. L. Taylor

During the period January 9 to 15 plantings in the vicinity of Fort Meyers, Florida, were examined.

In this section, vegetables are raised on sandy soil, mostly "flat pine land" with soil of the Leon type. The principal crops at this time are tomatoes, potatoes, eggplant, peppers, and gladiolus. Cabbage, squash, cucumbers, cauliflower and other vegetables are also grown. An abundance of artesian water with a considerable content of hydrogen sulphide is

available and is used for irrigation.

A 4-acre planting of young squash west of Fort Meyers was found to have about 25% of the plants stunted by severe root-knot (Heterodera marioni) infection. The squash followed a planting of Porto Rico sweet potatoes.

Four acres of peppers in a field that had not been cultivated for several years were practically free of rootknot as were 2 acres of tomatoes and 2 acres of eggplant.

Ten acres of a 40-acre planting of cucumbers on Pine Island had over 95% of the plants heavily infected with rootknot with apparent damage on this portion of the field of about 75%. The other 30 acres had only a trace of rootknot, with no appreciable damage. The sandy, well drained soil was idle last year following 2 crops of peppers and a cover crop of sesbania. Volunteer sesbania plants around the edges of the field were found to be heavily infected with rootknot. The grower was apparently unaware of the damage to his crop.

A 4-acre pepper field was found to have severe rootknot on about 25% of the plants. On this field, corn had been used as a cover crop after severe rootknot on tomatoes.

Severe rootknot was found on roots and tubers in a small section of a 40-acre potato field. Adjacent to this field was another that was reported to have been heavily infested with rootknot year before last, with a large loss in yield. The field was kept in clean cultivation for the next season. No rootknot was found at this time. It is planned to visit this section again when the tubers are being harvested and conditions will be ideal for estimating the amount of infection and damage.

On Sanibel Island, rootknot was found on a small seedbed containing peppers and eggplant. An adjacent 2-acre tomato field had 75% severe rootknot with a probable 50% reduction in yield. The sandy soil of this field contained a large percentage of fragments of sea shells. The rootknot infection was most severe on the higher and drier portions of the field. Another tomato planting on the same island had 25% severe rootknot.

Generally speaking, it is easy to find rootknot infection in almost any location in this area, but the cases reported above were the worst found in about 4 times that many fields examined. Apparently, it is only occasionally that it is severe enough to cause any appreciable damage. According to the County Agent, few farmers make any particular attempt to control rootknot. Except for the potato growers, most farmers try to avoid planting the same crop on land more than 2 years in succession, and in most cases, change crops every year. Also, land is fairly cheap and plentiful. New areas are constantly being cleared and some of the old land is always idle. Crotalaria is extensively used as a cover crop. Probably these circumstances, together with occasional flooding or water-soaking of the land by heavy rains, gives a certain amount of rootknot control. The most obvious mistake made, in the light of present knowledge, is the use of sesbania as a cover crop.

Recommendations. 1. Cross inoculation experiments with the local strains of rootknot nematodes and the local cash and cover crops would probably be of great value to the farmers of this region.

2. The use of sesbania as a cover crop should be discouraged.

3. Here as elsewhere, more information about nematodes should be placed in the hands of the growers.

EMERGENCY PLANT DISEASE PREVENTION PROJECT

REPORTS ON TOMATO DISEASES

TOMATO DISEASES IN THE EAST COAST AREA OF SOUTHERN FLORIDA: About 700 acres of tomatoes, all south of Miami, were surveyed during the period January 5 to 15. The loss from a frost on December 20 varied from little up to 100% with about a 40 to 50% estimated loss on approximately 200 acres; other acreage was damaged. In addition certain diseases, such as early blight and Sclerotinia stem and fruit rot, undoubtedly were more severe as a result of the freeze and cool weather.

Early blight (Alternaria solani) was frequently found in a mild form, but on 65 acres the estimated loss was 50%. Several farmers stated that copper-lime dust did not control the disease.

With Dr. George Ruehle, Dr. G. R. Townsend, and Dr. W. D. Moore, several large tomato fields were examined on marl soil east of Homestead, in which a high percentage of the plants were affected by Sclerotinia stem and fruit rot (Sclerotinia sclerotiorum) with losses up to 25%. In addition to tomatoes the fungus was attacking snap and pole beans, cabbage, turnips, and New Zealand spinach. Near Pompano the fungus was seen killing ragweeds.

Ripe rot (Phoma destructiva), rootknot (Heterodera marioni), late blight (Phytophthora infestans), bacterial spot (Xanthomonas vesicatoria), soil rot (Rhizoctonia solani), and mosaic (virus), were seen in small amounts.--Russell A. Hyre, Emergency Plant Disease Prevention Project.

BOTRYTIS STEM GIRDLING OF TOMATO PLANTS IN OHIO: Several greenhouses in northern Ohio were examined during the period January 10 to 16. In most the spring crop of tomatoes is just getting started. In one establishment where a portion of the old crop was still productive, the grower's practice of cutting off the lower leaves for about 3 feet above ground was causing him trouble. An examination showed that Botrytis [cinerea], attacking through the stub of leaf petiole left after the pruning operation, subsequently invaded the main stem and frequently girdled it. Wilting of the plant resulted. About 5% of the plants in several houses were killed. A temperature of 55°F. at night was favorable to the development of the fungus.

Young tomato plants were found to be generally healthy with the exception of a few killed by damping-off fungi where they were kept too wet. -- M. R. Harris, Emergency Plant Disease Prevention Project.

REPORTS ON DISEASES OF SPINACH

SPINACH DOWNY MILDEW IN A MUCK SOIL AREA OF NORTHERN FLORIDA: On January 24 a trip was made in company with experiment station workers to visit vegetable plantings on muck soil at Zellwood, Orange County. A total of more than 60 acres of spinach was examined in plantings of various ages. Of the 100-acre planting of Savoy spinach on one farm operation all had been harvested but about 17 acres. This crop was being grown for shipment to a northern concern that canned it for baby food.

Downy mildew (Peronospora effusa) was said to have been first noticed developing on the remainder of this planting about 10 days prior to our visit, and a complaint had been received of some deterioration in transit due to this disease in the last car that had been shipped. The company to whom the spinach was being shipped, having the high standard and reputation of their product at stake, called a halt on further shipments and the cutting of the balance was deferred. The cool, cloudy weather of the past few days stimulated a rapid spread of the mildew from the lower leaves that were first to become infected, and extensive dead areas had since developed on the lower leaves. It was estimated that fully 50% of the 17 acres remaining could be salvaged for sale elsewhere by trimming off the diseased leaves, but the high price and scarcity of labor made the value of this procedure questionable. The company officials were considering simply discing under the remaining acreage although it represented an investment of $30 an acre aside from the rental value of the land. The closeness of the plants in the rows appeared to favor the development of the disease, and the curled leaves rendered dusting impractical. Had the cutting of the balance of this planting proceded as scheduled when the mildew first appeared, the crop could probably have been marketed with relatively little loss.

A 10-acre planting by another operator nearby also was found to have developed downy mildew, 1 or 2 leaves on many of the plants already showing sporulating fairly large spots. The infection appeared general throughout this planting.

A 30-acre planting of Giant Noble and Old Dominion spinach by another operator also showed general mildew infection. However, in this case the spread of the disease appeared to have been checked and the infected leaves were drying up. This field had been dusted with Copper-Hydro by airplane, and some rows also were dusted again from the ground, evidently very effectively, although, unfortunately, from the standpoint of appraising its value for the control of the disease, no rows were left undusted.

A deficiency, apparently of manganese, was of general occurrence in this planting and various plots had been treated with sulfur-manganese, zinc, and Maturox in an effort to correct this trouble. No very striking results were apparent.

Downy mildew was beginning to develop on another planting, about a month old, by the same operator. Occasional yellowish spots were found on the leaves but there was no evidence of sporulation. However, lesions on leaves gathered late in the afternoon and carried back to Gainesville in a paper bag were sporulating profusely the following morning.

This appears to be the first year that any considerable acreage of spinach has been grown in Florida. Further experience with downy mildew may show that the crop should not be grown during that season when the temperature range is most favorable for the development of the disease. -- Arthur S. Rhoads, Emergency Plant Disease Prevention Project.

SPINACH DISEASES IN THE WINTER GARDEN REGION OF TEXAS: During the period January 8 to 24, 1870 acres of spinach were examined. Downy mildew was the most widespread and prevalent disease observed, being noted in nearly every field surveyed, occurring on dry-land spinach in Frio County, as well

as on irrigated spinach in Dimmit, Zavala, and Webb Counties, in amounts varying from a trace to nearly 100% in the fields surveyed.

White rust (Albugo occidentalis) was localized; it was observed in only 2 plantings in Dimmit and Zavala Counties not reported previously. Considerable loss resulted in a 50-acre planting of flat-leaf spinach at LaPryor, Zavala County, due to nearly 100% infection with white rust.

Leaf spot (Heterosporium variabile) was localized in plantings in Dimmit, Webb, and Zavala Counties. Moderate to severe infections were observed, in sections of the fields, near Laredo, LaPryor, and Crystal City.

Aster yellows remained the most widespread and prevalent virus disease of spinach in the Winter Garden region. The disease was apparent in all of the mature spinach surveyed during this period; however, in no instance was the loss greater than 5%.

Curly top (virus)-infected plants were observed in nearly every planting surveyed, but the loss was limited to a few plants and never exceeded 1% in any one field.

Plants infected with the mosaic virus were limited in number and localized. An occasional affected plant was observed in fields in Dimmit, Webb, and Zavala Counties. In a planting of flat-leaf spinach near LaPryor at least 1% of the plants were infected. -- Howard W. Larsh, Emergency Plant Disease Prevention Project.

REPORTS ON DISEASES OF CRUCIFEROUS CROPS

DISEASES ON CABBAGE AND BROCCOLI IN NORTHERN FLORIDA: In the vicinity of Leesburg, Lake County, various plantings of cabbage totaling 126 acres were observed on January 8. All appeared free from diseases with the exception of one field in which, on one side, a considerable number of more or less scattered plants showed a pronounced chlorotic condition. The outer, whitened leaves of some of these plants showed evidence of downy mildew infection and the plants that were pulled up for examination were characterized by poorly developed root systems. However, the chlorotic condition appeared to be due to a deficiency, probably of manganese. This trouble did not occur in the balance of the field, nor in another planting by the same operator. The grower reported having experienced it in the same place last year and stated that such white plants did not develop heads of any considerable size.

One large grower of cabbage reported that downy mildew (Peronospora parasitica) had been troublesome in his seedbeds and had become progressively worse in his 3 plantings. The last seedbed, which was seen, was so severely attacked by downy mildew that only 3 field boxes of plants were pulled before it was abandoned. The grower admitted that he had omitted a couple of sprayings, which undoubtedly was responsible for the heavy loss. The plantings in this last series of seedbeds totaled about 1/4 acre and probably represented a loss of about 20 pounds of seed alone.

On January 24 a trip was made in company with Experiment Station workers to visit vegetable plantings on muck soil at Zellwood in Orange County. A 5-acre broccoli planting was characterized by about an 80% stand and general infection of the older leaves by downy mildew. The plants in

general were quite backward, chiefly as a result of having gone through 4 freezes, but had been sidedressed recently with fertilizer and should improve rapidly with more favorable weather. -- Arthur S. Rhoads, Emergency Plant Disease Prevention Project.

CABBAGE DOWNY MILDEW IN THE FLORIDA EAST COAST REGION: From January 5 to 15 a survey was made in the vicinities of Pompano and Homestead. Nine cabbage seedbeds, about 250 feet in length, and 30 acres in the field, were observed. Downy mildew was abundant in the seedbeds and on 5 acres of small seedlings in the field and threatened to destroy them. No fungicides had been applied. Thirty acres of older plants in the field showed mildew on the bottom leaves only and the loss will be negligible. -- Russell A. Hyre, Emergency Plant Disease Prevention Project.

DOWNY MILDEW AND OTHER DISEASES ON CABBAGE IN MISSISSIPPI AND LOUISIANA: In the area at and around Crystal Springs, Mississippi, downy mildew was general on cabbage. It was found on plants in the cotyledonary stage on up to plants with 4 to 5 true leaves. On these larger seedlings the disease resembles rust somewhat and is so called by the farmers in that area. Damage apparently was less severe than has been reported in the past. Transplanting from coldframes to the field had just begun. One commercial grower of cabbage slips, at Summit, reported that the variety Early Wakefield was more susceptible to downy mildew attack than other varieties he had grown.

In some coldframes visited in the Crystal Springs area there was evidence of both pre- and post-emergence damping-off. Wire-stem (Rhizoctonia sp.) was evident on seedlings in several coldframes but not to any extent.

In fairly large cabbage plantings near Amite, Louisiana, there was no evidence of downy mildew either on the seedlings or on the mature plants. One grower stated that his plants had been affected last fall but none was seen at this time. In this area seeds are sown in the field and not in coldframes. Black rot (Xanthomonas campestris) was present on about 10% of mature plants in 2 small fields. Cold injury accounted for an estimated 1 to 3% loss in these same fields. -- Douglas C. Bain, Emergency Plant Disease Prevention Project. January 16 - 22.

DISEASES OF CRUCIFEROUS PLANTS IN THE WINTER GARDEN REGION OF TEXAS: During the period January 8 to 24, 470 acres of various cruciferous plants were examined.

Broccoli, cabbage, and cauliflower plantings showed the presence of leaf spot (Alternaria brassicae) and downy mildew. In most plantings the lower leaves were yellow and in many instances defoliation had occurred.

In a 125-acre broccoli planting near Laredo, Webb County, moderate to severe Alternaria leaf infection was apparent, as well as slight injury to the flower buds.

Cabbage plantings most severely affected by downy mildew were observed near Poteet, Atascosa County, and Cotulla, LaSalle County. In each instance most of the outer leaves were infected and slight defoliation had resulted.

Infection of cauliflower heads by Alternaria in a 40-acre planting near

Poteet was causing a loss of nearly 10%.

Symptoms characteristic of virus diseases were observed in several instances on cabbage and once on mustard, including clearing of the veins, asymmetrical leaves, stunting, and proliferation of the foliage near the crown. In most instances these conditions resemble those manifested by plants infected with the aster yellows virus, but in the majority of cases yellowing was absent or not very pronounced. -- Howard W. Larsh, Emergency Plant Disease Prevention Project.

CAULIFLOWER DISEASES IN CENTRAL CALIFORNIA: Fields of cauliflower observed in the Hollister-Gilroy area during the week ending January 15 showed light infections of downy mildew, leaf spot (Alternaria sp.), and mosaic (virus).

In Santa Clara County, the main crop at this time of the year is cauliflower. In general, this crop was found to be relatively free from disease. There was a heavier infection of downy mildew than had been noted previously, but, since it was confined mainly to the outer leaves, little damage resulted. A small amount of mosaic and black ring (virus) were also present.

Root rot (Phytophthora megasperma) had wiped out the plants in an area of approximately 1/4 acre at one end of a field where the soil was too wet. -- Horace L. Barnett, Emergency Plant Disease Prevention Project.

ASTER YELLOWS AND OTHER CARROT DISEASES IN THE TEXAS WINTER GARDEN REGION

Howard W. Larsh

During the period from January 8 to 24, carrot plantings surveyed in 7 counties totaled 1246 acres.

Infection with aster yellows (virus) varied from 1 to 82%, as shown in the following summary:

County	Acres observed	Average infection %	Range of infection %
Atascosa	25	1	1 - 3
Dimmit	565	23	1 - 59
Frio	140	Less than 1	Less than 1
LaSalle	5	7	7
Uvalde	66	62	28 - 82
Webb	210	24	1 - 58
Zavala	235	30	1 - 82

The variety Danver Half Long, in addition to Chantenay and Imperator, was found to be susceptible to the virus.

Unfavorable growing conditions have prevailed in this area during the past 4 to 6 weeks, and young carrots have grown very little during this

period. The amount of aster yellows present has not increased in the proportions reported as characteristic of fields surveyed earlier.

The adult insect vector seems to have decreased in number in some of the regions surveyed recently; however, an increase in the number of nymphs has been observed.

Leaf blight (Macrosporium carotae) [Alternaria carotae] is becoming more apparent in the region, very few fields being free from at least a few infected plants. Considerable yellowing and death of the foliage was observed in LaSalle, Uvalde, and Dimmit Counties.

Leaf spot (Cercospora carotae) was observed in 2 or 3 plantings. Loss was negligible even in the most severely affected planting noted, near Carrizo Springs in Dimmit County.

Carrots infected with the rootknot nematode (Heterodera marioni) were observed in 3 plantings in Webb County; in one of them, a 50-acre field near Laredo, it was causing nearly 15% loss in a localized area. EMERGENCY PLANT DISEASE PREVENTION PROJECT

OTHER REPORTS ON DISEASES OBSERVED IN WINTER VEGETABLE-GROWING AREA

BEAN DISEASES ON THE EAST COAST OF SOUTHERN FLORIDA: About 850 acres were surveyed in the vicinities of Pompano and Homestead, January 5 to 15. Loss from frost was estimated at 10% or less around Pompano; in the vicinity of Homestead it was 75 to 80% with many acres a complete loss.

Rhizoctonia solani, stem rot, is less of a problem in the later plantings this year on the sandy soils around Pompano, where the estimated loss amounts to only a few percent, than it is around Homestead on the wetter marl soils. In the latter region losses often are 10% or more, and in one small field the loss was estimated at 50%.

Dr. W. W. Ray is consistently isolating a Fusarium of the F. solani type from stem rot specimens from the Pompano region, and obtained it from a few specimens from Belle Glade also. Therefore, my past estimates included losses from Fusarium dry root rot as well as from Rhizoctonia stem rot.

Sclerotinia sclerotiorum, watery soft rot, has been found this season on a number of farms in the vicinity of Pompano but has caused little economic loss thus far. The crop from a 4-acre field was sold to a cannery at a 30¢ to 50¢ reduction in price per hamper due to watery soft rot. This disease has been much worse on the marl soils in the vicinity of Homestead. According to Dr. George Ruehle it is threatening the bean-growing industry on 5000 acres or more in that region. One grower with a considerable acreage stated that this is his last year for growing beans unless he can find non-infested land. The disease was widespread in the Homestead area and often was found on beans in the pre-bloom stage.

Sclerotium rolfsii, southern blight, occurred to the extent of 1 to 2% on several hundred acres in the Pompano area. -- Russell A. Hyre, Emergency Plant Disease Prevention Project.

and celery (Calif., Tex.)

BEET DISEASES: Horace L. Barnett reported light infection of downy mildew (Peronospora schachtii) and moderate infection of rust (Uromyces betae) in garden beets planted for seed production in the Gilroy-Hollister area of central California.

Light infections of leaf spot (Cercospora beticola) were observed in most of the 140 acres surveyed in the Texas Winter Garden region, according to Howard W. Larsh, with considerable spotting and slight defoliation in plantings near Asherton in Dimmit County and Laredo in Webb County.

CELERY DISEASES: In the 2 acres of celery observed in the Texas Winter Garden region, early blight (Cercospora apii) was noted on several plants that had been planted last September. Symptoms characteristic of mosaic (virus) were observed on 3 plants which were somewhat dwarfed, with yellowish and distinctly mottled leaves. -- Howard W. Larsh, Emergency Plant Disease Prevention Project.

The few fields of celery seen in the vicinity of Salinas in central California showed light infections of aster yellows (virus), and only traces of late blight (Septoria apii). -- Horace L. Barnett, Emergency Plant Disease Prevention Project.

DISEASES OF CUCUMBER AND SQUASH IN THE EAST COAST AREA OF SOUTHERN FLORIDA: Cucumber plants in 2 acres seen near Pompano were being defoliated by downy mildew (Pseudoperonospora cubensis).

About 30 acres of squash were observed near Homestead. Frost and wet soil caused considerable loss, and small amounts of mosaic (virus), powdery mildew (Erysiphe cichoracearum), and anthracnose (Colletotrichum lagenarium) were present. -- Russell A. Hyre, Emergency Plant Disease Prevention Project, January 5 - 15.

STEM CANKER OF EGGPLANT IN FLORIDA: Twenty acres of eggplants were observed in the Pompano area. A sub-surface stem canker, caused by a fungus identified by Dr. W. W. Ray as Phomopsis vexans, was causing 65 to 70% loss in 8 acres, 20% loss in another 2 acres, and other smaller losses were seen. -- Russell A. Hyre, Emergency Plant Disease Prevention Project, January 5 - 15.

DAMPING-OFF OF LETTUCE IN NORTHERN FLORIDA: A grower at the north end of Levy Lake, near Micanopy, Alachua County, had reported serious loss from damping-off in his lettuce seedbeds, totaling 1/4 acre. The farm was visited January 10. In the older beds, where the stand of plants evidently had been good, the majority of the seedlings were found to have died. Some surface damping-off occurred in places, but most of the plants appeared to have been attacked first on the lower protion of the root system, new roots being put out above the diseased roots in some cases. In 2 younger beds with plants in the cotyledon stage, where seed had been treated and the soil watered with a solution of Spergon, no evidence had appeared as yet. Cultures from diseased plants made by Dr. W. B. Tisdale yielded both a Pythium and a Rhizoctonia. This grower had planned on raising enough plants to set from 80 to 90 acres but estimated that he would do well to have enough for 10 or 12 acres. -- Arthur S. Rhoads, Emergency Plant Disease Prevention Project.

DISEASES OF LETTUCE AND ENDIVE IN THE TEXAS WINTER GARDEN REGION: Sixty-five acres of lettuce plantings were surveyed. Damping-off caused con-

siderable loss in a 6-acre planting in Atascosa County.

Aster yellows was observed in all the lettuce plantings examined with the exception of small garden plots. The amount of loss varied with the age of the planting: in young lettuce it ranged from 1 to 7%; whereas the most severely infected mature lettuce planting showed 32%.

Bacterial soft rot (Erwinia carotovora) caused considerable loss in a 10-acre lettuce field near Winter Haven, Dimmit County.

Endive plantings totaling 175 acres were examined. No apparent increase of aster yellows was noted in fields near Winter Haven. A single plant with symptoms characteristic of this virus disease was observed in a planting of broad-leaf endive near Carrizo Springs, Dimmit County. -- Howard W. Larsh, Emergency Plant Disease Prevention Project. January 8 - 24.

ONION DISEASES IN THE TEXAS WINTER GARDEN REGION: Onion plantings totaling 225 acres were surveyed. Pre-emergence damping-off and rotting of the seeds caused nearly 25% loss in a 40-acre field near Crystal City, Zavala County. Slight hail injury was observed in several plantings in Dimmit and Zavala Counties.

Pink root (Phoma terrestris) was observed in plantings in Atascosa, Dimmit, LaSalle, and Zavala Counties; on dry-sets it was noted at Big Wells, Dimmit County. Infection varied in "seedbeds" from a trace to nearly 100%. -- Howard W. Larsh, Emergency Plant Disease Prevention Project. January 8 - 24.

PEPPER DISEASES IN THE FLORIDA EAST COAST AREA: In the vicinity of Pompano 75 acres were observed. Leaf spot (Cercospora capsici) was severe on 13 acres, where it was causing, along with sun scald, a loss estimated at 30%. It occurred in small amounts on another 45 acres at early harvest, but apparently will cause little loss.

Bacterial spot (Xanthomonas vesicatoria) was generally present and severe in spots on 40 acres. Fruit infections were just appearing. -- Russell A. Hyre, Emergency Plant Disease Prevention Project. January 5 - 15.

DISEASES OF SALSIFY IN CENTRAL CALIFORNIA: In the Hollister-Gilroy area salsify grown for seed showed light amounts of powdery mildew (Erysiphe cichoracearum) and aster yellows (virus). -- Horace L. Barnett, Emergency Plant Disease Prevention Project. Week ending January 15.

ALTERNARIA TUBER ROT AND OTHER DISEASES ON STORED POTATOES IN NORTH DAKOTA

Ian W. Tervet

A survey of potatoes in storage was made in Traill, Grand Forks, Walsh, and Pembina Counties of North Dakota in the company of Dr. F. Gray Butcher of the North Dakota Agricultural College.

Relatively little loss from disease except for the cases given below is occurring in the large potato crop still in storage in North Dakota.

Potatoes are keeping well, there being no signs of sprouting in Cobblers, and not a great deal in Triumphs, although a few bins of Triumphs have heated and are sprouting. The most serious problem to the grower is in the disposal of his crop, the shortage of cars being severely felt especially in the northern part of the Red River Valley.

The disease most widely spread and doing most damage is dry rot (Fusarium). Heaviest infection of dry rot was 5% in one bin of Triumphs, but the average infection in about 20 warehouses examined did not exceed 1.0% in Triumphs and somewhat less than that in Cobblers. Cuts and bruises in tubers did not heal as well as usual last fall. Because of the hard dry soil at digging, and the apparent necessity of getting a large crop into storage quickly, potatoes were not always handled as carefully as necessary by the frequently inexperienced crews, skinned and cut tubers being present in higher proportions in the crop than in most years.

Loss from late blight tuber rot (Phytophthora infestans) was very light, for while infected tubers could be found in almost all warehouses, loss did not exceed 0.1% of the crop in storage.

Bacterial ring rot (Corynebacterium sepedonicum) was found in some warehouses, but in no case was any heavy infection encountered, infection from this disease not exceeding a trace.

A few bins of Triumphs had from a trace to 5% of hair sprout; however, there is no indication that any severe outbreak of this disease should be expected.

Alternaria tuber rot (Alternaria solani (Ell. & Martin) Jones & Grout) developed unusually heavily in 2 localities in Grand Forks County and in one locality in Walsh County. The severity of the disease was such that the infection had been considered earlier by the growers to be due to a superficial type of late blight. Infection was so serious in a few lots of Cobblers, Chippewas, and Red Warbas that the stocks could not meet certified seed grade standards. The growers concerned suffered considerable loss. Triumphs were not attacked by early blight to any extent, occasionally, small lesions being found but never to such an extent as to affect the grading of the crop. No lesions were seen on the Katahdin variety.

Lesions on Cobblers were as large as 2 ins. in diameter; many tubers had several small lesions, 1/4 to 1/2 in. in diameter and not infrequently elongated narrow lesions were seen. These narrow lesions seemed to follow cracks or cuts in the skin in some cases, but there was not a constant association of the early blight with a cut or crack in the tuber.

It was not possible to determine the factors determing the heavy tuber infection in the 3 localities most severely affected. Indeed not all potatoes in these regions were attacked, for while tubers from one field of Cobblers were heavily attacked, a second field of Cobblers from the same area had few infected tubers and the injury to the tubers was light.

Vine infection was not more severe in the regions where heavy tuber infection occurred than in those areas with no, or only slight, tuber infection. There did not appear to be any differences in handling the crop that would explain the severe infections found and the cause of the isolated severe infections is difficult to explain, unless variations in soil conditions were important. Some additional knowledge on the factors

influencing tuber infection by Alternaria solani is necessary.
EMERGENCY PLANT DISEASE PREVENTION PROJECT

OTHER REPORTS ON POTATO DISEASES

(Mass., Ohio, Idaho) and field diseases (Idaho)

POTATO STORAGE ~~DISEASES IN MASSACHUSETTS.~~ During the period January 9 to 15 inspection of stored food crops was conducted in Middlesex, Worcester, and Hampden Counties. Fourteen potato bins were seen in 9 storages; 7 of the storages were in Hampden County.

Very few potatoes are produced in Middlesex and Worcester Counties, and the potato area of Hampden County was included in the drought region of southern New England. Hence the potato area covered by this report was not subject to any appreciable late blight attack this summer. Only 3 of the 14 bins showed late blight rot, only a trace being noticeable in each of the 3 bins.

Rhizoctonia (Rhizoctonia solani) was found in 11 of the 14 bins. It seemed to be almost universally present in Hampden County potatoes. In 2 cases noted the disease was very prevalent, 75% and 95% of the tubers being affected, but was not very severe. In the 11 bins prevalence ranged from a trace to 95% with an average of 21%.

Bacterial ring rot was found in 1 storage in Westfield, Hampden County, on potatoes grown in Chesterfield, Hampshire County. The grower had planted certified seed but lacked enough for about 1 acre, for which he purchased "selected seed". Potatoes from this acre contained at least 10% rotted tubers at this inspection. Unfortunately, the grower had dug the ring-rot affected area last and dumped the potatoes over the top of his table stock. Being scattered over the top of the bin and subjected to sweat from the pile, the rotted tubers were in a wet condition and are now liable to decay by secondary soft rot organisms.

Scab (Actinomyces scabies) was found in 10 of the 14 bins, but was not important except in 2 cases, one of 15% prevalence and another of about 45%.

Net necrosis (leaf roll virus) was found in 4 bins, all of Green Mountain potatoes; 1 affected bin contained a trace, the others 2, 5, and 15%.

Stem-end browning (cause unknown) also was found in 4 bins, all Green Mountain; in 3 of these bins no net necrosis was found. Prevalence in the affected bins was trace, 5%, 5%, and 20%.

Five bins contained sun-burn affected tubers, as follows: 1 bin of Sebago, a trace; 1 of Green Mountain, a trace; 3 bins of Katahdin, 10%, 15%, and 35%, respectively.

One bin of Green Mountain in Agawam contained a trace of Fusarium tuber rot.

One bin in Westfield contained a few sacks of frozen potatoes. The house had been allowed to get too cold.

During the period January 16 to 22, 11 bins were examined in 9 storages in Franklin and Essex Counties.

Scab was found in 7 bins, its prevalence ranging from a trace to 25% with an average of about 11%. In general, severity was rather light; however, in 1 bin of Katahdin in Amesbury with 25% prevalence surface cover-

age was also rather extensive.

Rhizoctonia was found in all 11 bins, ranging from a trace to 75% with an average of about 18%. It was severe in only 1 bin of Green Mountain in Gill.

Only a trace of late blight was found in 2 bins of Green Mountain, 1 in Northfield and 1 in Gill.

About 10% of the tubers in 1 bin of Green Mountain in Gill showed typical spindle tuber (virus).

Four bins of Green Mountain showed a trace, 1%, 15%, and 25%, respectively, of net necrosis.

In 3 bins of Green Mountain a trace, 2%, and 7%, of stem-end browning was observed.

Hollow heart (nonparasitic) occurred in 1 bin of Russet with a trace; 1 bin of Katahdin, trace; 5 bins of Green Mountain, trace, trace, 2%, 5%, and 5%. A considerable amount of secondary decay was appearing in the hollow potatoes in 1 of the bins with 5% in Gill.

A trace of field sun-burn (nonparasitic) was found in 1 bin of Katahdin. -- Robert C. Cassell, Emergency Plant Disease Prevention Project.

POTATO STORAGE DISEASES IN OHIO: Several bin inspections of potatoes were made in Stark, Portage, Lorain, Ashtabula, and Huron Counties during the period January 10 to 15. Several of these growers had entered the past year's crop for war approved seed. The varieties seen were Katahdin, Sebago, Russet Rural, and Erie. All lots of potatoes examined had been grown from certified seed of the 1942 crop. Several lots including all of the varieties were found infected with the ring rot organism. One grower had 1,000 bushels of Katahdin seed, consisting of the smaller tubers sorted out of his commercial stock, which he was planning on using for the 1944 crop. An examination showed that ring rot infection ranged from 5 to 10%. Other lots averaged from 1 to 5%.

All lots of potatoes examined were quite free from late blight infection of the tubers. Several lots showed some infection by scab but in no lot were more than 5% of the tubers infected. One lot stored in a barn showed 1% of the tubers affected with a soft rot that appeared to be the result of freezing damage. Most lots of potatoes were dug from rather wet soil and had much of the soil adhering to the tubers, which made examination rather difficult. A number of the growers had short crops during 1943 because of adverse weather conditions. Two lots of potatoes were seen that were immature because of being planted too late to escape frost damage at the end of the season. Present indications are that seed potatoes for the 1944 crop of good quality or better will be scarce.

Several growers having the variety Sebago are finding that this variety has a tendency to sprout especially if kept at temperatures slightly above the optimum for potato storage. In the Katahdin variety many growers had tubers too large to qualify under the U. S. No. 1 grade and had to sort the seed lots being offered for war-approved seed. -- M. R. Harris, Emergency Plant Disease Prevention Project.

FIELD AND STORAGE DISEASES OF POTATOES IN IDAHO: On October 16, in potato fields visited at Homedale some bacterial ring rot was found, and considerable jelly-end rot (Fusarium javanicum var. radicicola) in tubers in the hot dry portion of the field in sandy areas.

Potatoes examined in a cellar at Declo, October 19, showed 20% or more "water rot", which has been said by some to be due to excess moisture in heavy soils. It is prevalent also near Aberdeen. A considerable amount was noted in potatoes in a large new cellar at Chester, October 21.

Between Aberdeen and American Falls, October 27, scab was extremely severe on Netted Gem and also on sugar beets in one field. Ring rot was noted in one field.

Ring rot, jelly-end rot, Fusarium, and traces of scab were observed in potatoes stored in cellars and warehouses and being sorted at Rupert, Paul, Burley, Unity, and Declo, October 28. In onelarge potato field near Declo the yield was extremely low - 100 sacks an acre - possibly because of the use of poor seed. Black leg (Erwinia phytophthora) appeared to be present in part of the field.

Frost damage and jelly-end rot were important factors noticed in potato sorters at Parma, December 3.

In a large potato storage cellar near Moscow, December 20, a trace of rot was noted, probably resulting from preharvest frost. Excessive moisture was present in the bins as evidenced by sweating, and probably part of this was due to rots not visible from the surface.

Potato rots of various kinds were common in cellars visited at Oakley, Burley, and Delco, January 15. One kind seems definitely to be associated with a certain type of soil. Water rot was severe in one cellar. Pre-harvest frost injury was common in some. Immaturity of the tubers has been an important factor this year in keeping quality.

Rots of various undetermined causes were present in one large cellar examined at Rupert January 17. Dealers said that losses were much greater this year than usual, partly because of immaturity and of frost damage.

On January 18 the whole day was spent visiting potato warehouses and watching sorting crews in 12 locations in the American Falls area. In general where frost was present in the dug stock losses in storage have been severe. In one large bin that broke down badly very little damage was apparent at digging time. There seemed to be good evidence that many previously sound tubers rotted when placed in bins with frosted potatoes. The injury appeared first around the lenticels and formed a sort of measles under the surface. These specks coalaesced and large, light brown, rotten areas resulted. It appeared that aeration was an important factor. Side rots through injuries were common and everywhere the notion prevailed that these rots around injuries developed more commonly this year and were deeper than usual. Jelly-end rot was very prevalent and vascular discoloration at the stem end was often seen. Dealers, foremen, and sorting crews without exception indicated that this was a "tough spud year". In several cases certain lots of potatoes were sorted twice, some 3, and a few 4 times, before grades could be made. Records were known where certain lots were finally discarded.

A definite record was made at Aberdeen on the occurrence of the rootknot nematode (Heterodera marioni).

On January 19 examination of potato cellars was continued around Aberdeen, Springfield, Liberty, and American Falls. Water rot was prevalent near Springfield; frost damage was excessive in bins at Liberty. One lot at Aberdeen had more rhizoctonia sclerotia on the tubers than any ever en-

countered. This and scab affected the grade so that many badly affected tubers were culled. Fusarium wilt vascular discoloration was common in a lot noted at Springfield. The most severe development of wound rot seen was in the cellar at American Falls.

In general, the cellars were kept too warm, too wet, and the tubers were piled too deep and in too large bins. In one cellar one 12-foot bin had sunk to about 7 or 8 feet. One bin was piled approximately 15 feet deep and in many cases several thousand sacks were piled bulk into huge bins with no ventialtion except along the sides. Large cellars seemed to be having more trouble than small ones partly because of the difficulty in cooling such large masses of potatoes stored in a short time.

On January 20 2 cellars were visited at North Pocatello. One cellar showed certain bins with severe frost damage and rot prevalent. Jelly-end was present in probably 20% of the tubers in one lot. Wound rot was extensive.

Rootknot nematode injury was found in one lot in this cellar. In the other cellar potatoes from a rather large field were so severely affected by rootknot that grading was practically impossible and severe loss was sustained. This crop was grown on land that showed slight rootknot injury 4 years ago with no potatoes grown until this year.

In 3 potato plants examined in Blackfoot the usual rots and deformities were present; as also in a large cellar at Osgood visited January 21. Wound injuries and water rot were common in the latter, which showed no excessive moisture and only a few small lots with frost damage.

In potatoes examined at the dehydration plant a considerable amount of wound rot and rhizoctonia was noted, and what appeared to be black leg in a few tubers. The sorting crews said that rootknot was very severe in some lots. In one car of potatoes (utility grade) one tuber was found showing severe rootknot injury. Another lot of the same grade showed excessive, about 20%, dry wound rot.

At the dehydration plant at Idaho Falls, January 22, rootknot was noted in one lot grown north of Idaho Falls.

In potatoes examined at Rigby, Rexburg, Sugar City, and St. Anthony, there was considerable dry (wound) rot, and in one lot grown east of Idaho Falls scab was so severe that it affected the grade materially. There appears to be excessive injury to tubers in handling and their wounds provide entrance for organisms which actively break down the tissue. Frequently small breaks in the surface develop into large pockets underneath and eventually ruin the market value. Everywhere there was evidence of difficulty in making grade and this wound rot type predominated in many cases.

On January 24 many lots of potatoes were examined in bins and as they went over the sorters in potato cellars and warehouses at Twin Falls, Buhl, and Filer. In one lot, Fusarium wilt symptoms in the tubers were very prevalent. Jelly-end in 2 lots ranged up to 25 and 50% and an interesting development was seen in that the rot extended much further into the tuber than usual. The development of this condition and the common term "black rot" are subjects for careful study. Frost damage in some lots was considerable. Everywhere it was noted that sorting crews were having difficulty in making grade.

On January 25, in potato cellars at Kimberly, Hansen, and Murtaugh, the usual rots were found, and in addition in one lot known to carry ring rot

a few rotting tubers showed typical symptoms. It should be noted that there was no evidence of unusual breakdown in the bins. At Murtaugh one lot was exceptionally good and one lot carried severe frost damage.

Very little rot was found, in general, in the several potato cellars visited January 26. Jelly-end rot was probably most commonly encountered.

Varying amounts of what is termed "shell rot" were found in several lots in potato cellars examined near Jerome, January 27. There are probably several causes for this condition, as yet not certainly identified. One lot at Dietrich showed considerable rot typical of ring rot. Fusarium wilt was severe in 2 lots. An odd condition was found, in one lot particularly, where a dry rot extended a half inch or so under the slightest of skin bruises, and made sorting almost impossible. Strangely enough, digger cuts were healed over in nearly all cases.

In potato cellars at Wendell and Gooding, January 28, frost damage was severe in certain lots and accounted for heavy cullage and loss of some bins. Jelly-end was severe in one lot. Dry rot was noted as rather prevalent in these cellars although wet breakdown was more common. -- Earle C. Blodgett, Emergency Plant Disease Prevention Project.

SWEETPOTATO STORAGE DISEASES IN TEXAS

G. M. Watkins

From January 17 to 20 a number of commercial sweetpotato storage houses in northeastern Texas were visited for the purpose of examining sweetpotatoes which were being graded and repacked for shipment at that time. Storage diseases had caused the greatest loss at Lindale, Smith County, where 4 large houses were observed. Black rot (*Ceratostomella fimbriata*) was present on 4 to 5% of the roots, and soft rot (*Rhizopus* spp.) appeared on an additional 5%. Surface rot (*Fusarium* spp.) caused a loss of less than 1% and charcoal rot (*Sclerotium bataticola*) occurred as a trace. Comparing with notes of an earlier visit to these same houses on October 26 to 27, 1943 (PDR 27:626) when sweetpotatoes were being harvested and stored, it is recalled that no black rot was seen then except on about a half dozen roots found among the culls at one house.

At Gilmer, Upshur County, 2 large storage houses were visited. One is a new house which was built without means of ventilation. In it the crates of roots are stacked directly upon the floor. Little damage from diseases was seen in either establishment at Gilmer. There was less than 1% loss from black rot and equally little damage from soft rot. A trace of surface rot was encountered.

Two sweetpotato houses were seen at Pittsburg, Camp County. In each of these 2% loss was estimated from black rot and 3% from soft rot.

Three storage houses were examined in Wood County, one at Quitman, one at Winnsboro, and one at Golden. Little damage from storage diseases was seen. A trace of black rot and a trace of soft rot were found in each.

The conditions under which sweetpotato seed stock was stored were especially bad in one house in Lindale. Bins about 8 feet square were used for the purpose, the roots destined for use in seed beds merely being dumped in to a depth of 3 to 6 feet. In such large masses the roots tended to

heat and many were sprouting prematurely. Upon raking back the uppermost roots to a depth of 6 inches in the pile it was found that most roots were partially or wholly consumed by Rhizopus soft rot.

EMERGENCY PLANT DISEASE PREVENTION PROJECT

DISEASES REPORTED ON STORED ~~FRUITS AND VEGETABLES~~ IN MASSACHUSETTS

R. C. Cassell

Apple. During the period January 9 to 15 stored food crops were examined in Middlesex, Worcester, and Hampden Counties, including 20 storages of apples mostly in Middlesex County. Nineteen were cold storage houses and one a common storage. Three were large central cold storages, the largest containing 225,000 bushels of apples.

Scab (Venturia inaequalis) was noted in 17 storages, for the most part representing old orchard infections, not storage scab. An appreciable amount of storage scab was found in only 1 storage, in Worcester, on apples produced in Vergennes, Vermont, with 100% storage scab. The average prevalence of scab in the 17 storages was about 18%.

Blue mold (Penicillium expansum) occurred in 12 of the 20 storages, averaging 2.5% in the 12 storages. The most serious case noted was 15% in Pepperell.

A trace of black rot (Physalospora obtusa) was found in 3 storages; a trace of botrytis rot (Botrytis sp.), in 2; and a trace to 1% of bitter pit (physiogenic) in 3.

During the following week 2 apple storages in Franklin County and 3 in Essex County were inspected. Scab was found in all 5, prevalence ranging from 1 to 15%, averaging about 8%. Here also most of the scab was from old orchard lesions rather than storage scab; however, storage scab was developing at one place. Severity was light in most cases.

Blue mold also was found in all 5 storages, in amounts from a trace to 3%. In Franklin County the blue mold observed mostly followed such injuries as squirrel bites and stem punctures.

About 75% of rather severe sooty blotch (Gloeodes pomigena) was found on Baldwin apples in 1 storage in Danvers. Traces of black rot were found in 2 storages; of botrytis rot in 3. Baldwin apples in 1 storage in Ward Hill showed 20% of light to severe bitter pit.

Carrot. In one rather large carrot storage examined in Auburn (January 9 to 15) the only noticeable disease was watery soft rot (Sclerotinia sclerotiorum), which was causing very little loss, possibly 0.5%.

During the period January 16 to 22 7 carrot storages were examined in Essex County. Carrots in general are keeping exceptionally well in this area. The 1943 crop was small and harvesting was done under dry favorable conditions.

Watery soft rot appeared as the most generally destructive disease, being found in 4 of the 7 storages, prevalence ranging from a trace to 2%. Severity was not great except that occasional rot pockets were developing. Small amounts of bacterial soft rot (Erwinia carotovora) were found in 4 storages ranging in prevalence from a trace to 1%. About 1% of black rot (Alternaria radicina) [Stemphylium radicinum] was found in 1 storage in

Danvers.

Onion. Two small onion storages were found in Essex County; one was keeping exceptionally well, the other not very well. Bacterial bulb rot (Pseudomonas alliicola) was found in both storages. It was the only disease noted in the Ward Hill storage where there was only a trace. In the Danvers storage about 1% bacterial bulb rot was observed. Traces of Fusarium bulb rot (Fusarium sp.), neck rot (Botrytis allii), Botrytis sp., and Penicillium sp., were also found in the Danvers storage.

Parsnip. Three large parsnip storages, all keeping very well, were inspected in Danvers. Slight amounts of watery soft rot (Sclerotinia sclerotiorum) were found in 2; of "rust" (cause unknown), in 1; and of shoulder injury, due to secondary fungi and bacteria following mechanical injuries or frost injury, in 1.

Squash. During the period January 9 to 15, 4 squash storages were inspected in Worcester County, ranging from small shipments in Worcester wholesale houses to individual farm storages of 25 tons and 150 tons. All of the storages were keeping exceptionally well for this time of year. Black rot (Mycosphaerella citrullina) was the predominant disease in the 2 large farm storages, probably ranging up to 0.5% prevalence in 1. Only traces of other diseases were found, including gray-mold rot (Botrytis cinerea), black mold rot (Rhizopus nigricans), and fusarium rot (Fusarium sp.), which were each found in slight amounts in 2 storages, and Alternaria sp. in 1 storage.

During the following week, 6 storages were seen in Middlesex and Essex Counties. In 2 of the storages the squash was keeping very well, but in the other 4 they had reached the stage where they should be disposed of as rapidly as possible. Black rot was the principal cause of deterioration. It was found in all 6 storages, prevalence ranging from 2 to 25% with an average of 12%. Although its prevalence was not excessive for the season, on individual fruits it was severe enough to cause the loss of the entire squash in a great many cases.

One rather severe case of gray mold rot was found, where the prevalence was about 10%. A trace was found in a second storage and about 1% in a third.

Alternaria rots (Alternaria spp.) were found in 3 of the 6 storages; prevalences were a trace, a trace, and slight.

A trace of black mold rot was found in 1 storage and about 2% in another. Traces of bacterial wilt rot (Erwinia tracheiphila) were found in 2 storages; and traces of fusarium rot in 2.

Turnip. Two turnip storages of fair size were seen, one in Middlesex County and one in Essex. A trace of club root (Plasmodiophora brassicae) was observed in the Middlesex storage.

EMERGENCY PLANT DISEASE PREVENTION PROJECT

FUNGOUS DISEASES OF FLORIDA FOREST TREES

William A. Murrill

Orchard trees like the orange, pecan, peach, pear, and mango, are watched with care and usually treated by specialists. Shade and ornamental trees, often of considerable value, and also grown under peculiar conditions, are in a class by themselves. The present treatment concerns wild native trees in forest, grove, or park. Many fungi that feed upon dead wood or structural timbers do not attack living trees. Most of these are excluded from the discussion, which is largely limited to species causing diseases in living trees native to Florida.

The subject may be conveniently divided into 4 main heads: Leaf Diseases, Trunk and Branch Diseases, Root Diseases, and Rust Diseases. For the scientific names of the hosts Small's "Manual of the Southeastern Flora" is followed as a rule. State records are based largely on specimens in the herbarium of the Florida Agricultural Experiment Station.

Leaf Diseases

Leaves of trees may be injured by cold, drought, insects, smoke, gas, drying winds, and other nonparasitic causes, but the present discussion is limited to injuries due to fungi. The sooty molds cover leaves with a black coating, making them unsightly and cutting off the light, although the mycelium is superficial. Powdery mildews send haustoria into the epidermal cells of leaves and feed upon the contents. Old leaves are less affected than young leaves and seedlings, by powdery mildew fungi. Sulfur dust will kill the mycelium, and destroying the fallen leaves will get rid of the winter spores, but little can be done in the forest to hold such fungi in check.

Leaf-cast of conifers, resembling sun-scorch or fire injury, is often conspicuous and sometimes rather injurious, but it assists in weakening the lower branches and thus promotes natural pruning.

Leaf spots are caused by a great variety of fungi, such as Septoria, Phyllosticta, etc., but resulting injuries are important in the forest only when defoliation results. In the spring, winter spores from dead leaves germinate on new foliage and infect it; summer spores produced thereafter infect other leaves, especially during rainy weather; and in the fall the winter spores start to develop again in the spots on old leaves, maturing by the time new growth of the host is ready for infection in the spring.

Following is a list of some of the fungi (exclusive of rusts) attacking the leaves of Florida native plants.

Capnodium grandisporum Ell. & G. Martin, on wax myrtle.

Ceratophorum uncinatum (Clint. & Pk.) Sacc., on mockernut hickory.

Cercospora cercidicola Ell., on redbud.

Cercospora moricola Cke., on red mulberry.

C. tuberculans Ell. & Ev., on sweet gum

C. xanthoxyli Cke., on toothache tree.

Cercosporella trichophila J. J. Davis, on Carolina ash
Cladosporium effusum (Mint.) Demaree, on swamp hickory.
C. sambuci Brun, on elder
Coccomyces lutescens Higgins, on wild cherry.
C. prunophorae Higgins, on hog plum.
Colletotrichum elasticae Tassi, on strangler fig.
Cylindrosporium saccharinum Ell. & Ev., on red maple.
Cytospora ambiens Sacc., on hog plum.
C. palmarum Cke., on palms.
Dimerosporium baccharidis (Berk. & Rav.) Sacc., on saltbush.
D. vestitum Earle, on saltbush.
Diplodia pruni Fckl., on hog plum.
D. quercus Fckl., on oak.
Entomosporium thuemenii (Cke.) Sacc., on hawthorn.
Englerulaster orbicularis (Berk. & Curt.) Hoehn., on hollies.
Exobasidium symploci Ell. & G. Martin, on horse sugar.
E. vaccinii (Fckl.) Wor., on Xolisma.
Fabraea maculata (Lév.) Atk., on hawthorn and wild cherry
Gloeosporium acerinum West, on red maple.
G. diospyri Ell. & Ev., on persimmon.
G. septorioides Sacc., on oak.
Graphiola phoenicis (Moug.) Poit. on cabbage palmetto.
Helminthosporium fumosum Ell. & G. Martin, on red bay
Hypoderma ilicinum Duby, on oak.
H. hedgcockii Dearn., on longleaf pine.
H. lethale Dearn., on loblolly pine.
Isariopsis linderae (Ell. & Ev.) Sacc., on native persimmon.
Leptothyrium foraminulatum Sacc. & Ell., on American holly.
Lophodermium maculare Fr., on farkleberry and magnolia.
Meliola amphitricha Fr., on red bay and wild olive.
M. araliae Speg., on swamp magnolia.
M. cryptocarpa Ell. & G. Martin, on loblolly bay.
M. manca Ell. & G. Martin, on wax myrtle.
M. nidulans (Schw.) Cke., on small-fruited dogwood.
Microsphaera alni DC. ex Wint., on oaks, American holly.
M. alni var. calocladophora (Atk.) Salm., on oaks.
Monochaetia desmazierii Sacc., on oaks.
M. pachyspora Bub., on chinquapins.
Morenoella quercina (Ell. & G. Martin) Th., on dwarf live oak.
Mycosphaerella convexula (Schw.) Rand, on hickory.
Pestalotia crataegi Ell. & Ev., on one-fruited hawthorn.
P. guepini Desm., on wild cherry.
P. stellata Berk. & Curt., on oak.
P. vaccinii (Shear) Guba, on Xolisma.
Phacidium curtisii (Berk. & Rav.) Luttrell, on American and dahoon hollies.
Phleospora mori (Lév.) Sacc., on red mulberry.
Phyllactinia corylea Pers. ex Karst., on winged elm, one-fruited hawthorn, etc.
Phyllosticta acericola Ell. & Ev., on red maple.
P. caryae Pk., on mockernut hickory.
P. cercidicola Ell. & Ev., on redbud.
P. cookei Sacc., on magnolia and swamp magnolia.
P. curtisii (Sacc.) Ell. & Ev., on bumelia.
P. glauca Cke., on swamp magnolia.
P. gordoniae Ell. & G. Martin, on loblolly bay.
P. livida Ell. & Ev., on live oak and water oak.
P. magnoliae Cke., on magnolia and swamp magnolia.

Phyllosticta micropuncta Cke., on red bay
P. minima (Berk. & Curt.) Ell. & Ev., on red maple
P. myricae Cke., on wax myrtle.
P. olece Ell. & G. Martin, on wild olive.
P. paviae Desm. on red buckeye.
P. persece Ell. & G. Martin, on red bay.
P. phomiformis Sacc., on post oak.
P. vaccinii Earle, on farkleberry.
P. viridis Ell. & Ev., on American ash.
Podosphaera oxyacanthae DC. ex D By., on wild cherry, wild plum, and hawthorn.
Ramularia fraxinea J. J. Davis, on ash.
R. fraxini Desm., on ash.
Rhytisma acerinum Pers. ex Lév., on red maple.
R. andromedae Fr., on xolisma.
R. decolorans Schw., on xolisma.
R. vaccinii (Schw.) Fr., on farkleberry, and xolisma.
Sclerotinia fructicola (Wint.) Rehm, on hog plum fruits, wild cherry.
Scorias spongiosa (Schw.) Fr.; honey dew on alder, holly, etc.
Septogloeum ochroleucum (Berk. & Curt.) Dearn., on chinquapin.
Septoria albopunctata Cke., on farkleberry.
S. fraxini Desm., on ash.
S. liquidambaris Cke. & Ell., on sweet gum.
S. magnoliae Cke., on magnolia.
S. niphostoma Berk. & Curt., on magnolia.
Septoria quercicola (Desm.) Sacc. On dwarf live oak
S. quercicola var. cinerea, on bluejack oak
S. rhoina Berk. & Curt., on common sumac.
S. sambucina Pk., on elder.
S. serpentaria Ell. & G. Martin, on laurel oak and wild olive.
Sphaeropsis juniperi Pk., on red
Sphaerotheca phytophila Kell. & Swing., on southern hackberry.
Stagonospora virens Ell. & G. Martin, on live oak.
Systremma acicola (Dearn.) Wolf & Barbour, on pines.
Taphrina coerulescens (Mont. & Desm.) Tul., on evergreen oaks.
T. communis (Sadeb.) Gies., on hog plum.
T. pruni (Fckl.) Tul., on hog plum and wild cherry.
T. varia (Atk.) Mix, on wild cherry.
T. virginica Seym. & Sadeb., on hop hornbeam.
Uncinula macrospora Pk., on dwarf hackberry and winged elm.
U. parvula Bke. & Pk., on southern hackberry.
Venturia applanata Ell. & Ev., on swamp magnolia.
V. asterinoides Ell. & G. Martin, on laurel oak.
V. crataegi Aderh., on hawthorn.
V. formosa Ell. & G. Martin, on wild olive.
V. fraxini Aderh., on ash.

Trunk and Branch Diseases

Injuries to the trunks and branches of forest trees are numerous and varied. Winds, lightning, fires, floods, smoke, poisonous gases, extremes of temperature, and wanton or careless destruction by man take a heavy annual toll. Poor soil or dry soil may so weaken a tree that it falls an easy prey to disease caused by a parasitic organism.

Galls may be caused by insects, fungi, bacteria, or mechanical injuries, and often serve as entrances for wood-rotting fungi. Near Gulf Hammock a large oak with a trunk gall fully 6 feet in diameter has been observed.

The losses from decay in the trunks of trees are enormous. The decay is caused by many species of polypores and a few gill and other fungi. When the protecting bark of a tree is injured or removed spores of these fungi germinate on the exposed wood and the mycelium feeds upon the cell walls by secreting dissolving enzymes. Later, fruiting-bodies are formed which give off millions of spores so light that they are borne by wind to other trees.

Control of these wood-rotting fungi in the forest is difficult because so many trees are wounded by fires, winds, insects, animals, and natural pruning. Fires, in particular, injure trees at the base, where the exposed wood is kept moist, thus promoting germination of the spores. If all diseased trees could be found and destroyed the problem would be largely solved. In the case of conifers exposed sapwood in young trees is protected by resin but this is not true of the heartwood in older trees.

Tree seedlings are often killed by damping-off fungi and they are also sometimes smothered to death by certain species of Thelephora. The silverleaf disease organism, Stereum purpureum Fr., enters the trunk or branches through wounds, and the leaves above the point of infection change color the following season.

Some of the wood-rotting fungi included in the following list of stem-disease organisms occur mainly as saprophytes following injury from some other cause.

Apiosporina collinsii (Schw.) Hoehn., on hackberry.
Corticium stevensii Burt, on American holly, buttonbush, hackberry, persimmon, common sumac, water gum, wild cherry, etc.
Daedalea westii Murr., on southern red cedar, causing heartrot.
Dialonectria erubescens (Desm.) Sacc., on laurel oak, wax myrtle, and wild olive.
Endothia parasitica (Murr.) P.J. & H.W.Anderson; to be expected on chinquapins in Florida.
Flammula penetrans Fr. and F. spumosa Fr.; regarded by some as root and butt parasites of forest trees.
Fomes annosus (Fr.) Cke., on pines and rarely on broadleaf trees.
F. australis Cke., on ash, oak, hickory, holly, persimmon, and red maple.
F. calkinsii (Murr.) Sacc. & D. Sacc., on evergreen oaks.
F. demidoffii Lév., on southern red cedar.
F. geotropus Cke., on box elder, black gum, magnolia, elm, linden, laurel oak, hackberry, red bay, sweet gum, and cypress.
F. marmoratus Berk. & Curt., on oaks, etc.
F. pini (Thore) Lloyd, on pines, very destructive.
F. populinus (Schum.) Cke, on maple, basswood, etc.
F. robiniae (Murr.) Sacc. & Syd., on black locust.
F. subroseus (Weir)Overh., on cypress, pine, and red cedar.
F. supinus Sw. ex Cke., on laurel oak, red bay, etc.
F. taxodii Murr., on pond cypress.
Ganoderma curtisii (Berk.) Murr., on oak, sweet gum, and certain other broadleaf trees.
G. pseudoboletus (Jacq.) Murr., on oak, maple, etc.
G. sulcatum Murr., on cabbage palmetto and other palms.

Hydnum cordiforme Scop. (H. erinaceus Bull. ex Fr.), on oaks, especially water oak, and many other frondose trees, attacking the heartwood.
Hymenochaete agglutinans Ell., on alder, maple, etc.
H. curtisii (Berk.) Morg., on oak, etc.
H. corticola Berk. & Rav., on oak, elm, magnolia, and certain other broadleaf trees.
Hypholoma fasciculare Huds. ex Fr., on roots and butts of many forest trees.
Irpex mollis Berk. & Curt., on oaks, etc.
Lentinus lepideus Fr.; rarely attacking the heartwood of living pines.
Lenzites betulina L. ex Fr.; considered by some as parasitic on hardwood trees.

Mycena epipterygia Scop. ex Quél.; parasitic on various trees.
Nectria episphaeria Tode ex Fr., on red maple.
Pleurotus ostreatus Jacq. ex Quél.; sometimes parasitic on frondose trees, attacking both heartwood and sapwood.
Polyporus circinatus Fr.; root and butt rot of pines.
P. conchifer (Schw.) Fr., on elms.
P. croceus Pers. ex Fr., on oaks, causing butt rot.
P. ellisianus (Murr.) Long, on pines.
P. fissilis Berk. & Curt., on oaks, hickories, sweet gum, etc.
P. giganteus Pers. ex Fr., on hardwoods.
P. gilvus (Schw.) Fr.; parasitic at times on various trees.
P. hirsutus Wulf. ex Fr.; rarely attacks sapwood of living trees.
P. hispidus Bull. ex Fr., on oaks.
P. lignoides Mont., on hardwoods.
P. ludovicianus (Pat.) Sacc. & Trott., on evergreen oaks, red maple, etc.
P. palustris Berk. & Curt., on pines.
P. persicinus Berk. & Curt., on live oak.
P. schweinitzii Fr., on pines and certain other conifers.
P. spraguei Berk. & Curt.; butt and root rot of oak, etc.
P. sulphureus Bull. ex Fr., on alder, ash, red maple, oaks, red bay, and rarely pines.
P. umbellatus Fr., on hardwoods.
P. unicolor (Schw.) Fr., on oak, maple, etc.
P. versicolor L. ex Fr., on catalpa, etc.
P. zonalis, Berk., on oak
Poria cocos Wolf, on roots of oak, magnolia, persimmon, saw palmetto, sand pine, and orange.
P. subacida (Pk.) Sacc.; root and butt rot of living conifers.
Schizophyllum commune L. ex Fr., on chestnut, mulberry, orange, and probably many other trees, attacking the sapwood.
Septobasidium alni Torrend var. squamosum Couch, on dahoon holly. This, and most of the other material in the genus, was determined by J. N. Couch.
S. burtii Lloyd, on plum.
S. castaneum Burt, on hawthorn, hickory, laurel oak and water oak.
S. curtisii (Berk. & Desm.) Boed. & Steinm., on ash and water locust.
S. langloisii Pat., on hawthorn, hornbeam, magnolia, and water oak.
S. leprieurii (Mont.) Pat., on magnolia.
S. mariani Bres., on may haw.

Septobasidium pseudopedicellatum Burt, on a large number of hardwood trees, such as holly, maple, hawthorn, elm, oak, and ash.
S. rugulosum Couch, on sweet gum.
S. sinuosum Couch, on hawthorn, hickory, plum, dahoon holly, laurel oak, wild cherry, and sweet gum.
Steccherinum (Hydnum) Ballouii Banker, occurs on white cedar in New Jersey, killing the tops. It may be looked for in northern Florida.
Stereum frustulosum Pers. ex Fr., on oaks.
S. rugosum, Fr., on laurel cherry and perhaps other trees.
S. subpileatum Berk. & Curt.; butt rot of oaks.
Thelephora fimbriata Schw., T. grizeozonata Cke., T. intybacea Pers. ex Fr., T. terrestris Ehr. ex Fr.; these fungi are not parasitic but grow about the stems of seedlings and smother them.
Ustulina vulgaris Tul.; decayed spots on living oaks, possibly parasitic.
Volvaria bombycina Schaeff. ex Fr., on various hardwood trees.
Xylaria spp.; probably causing heart rot of hardwood trees in Florida, but the injury to forest trees is not extensive.

Root Diseases

Diseases of the roots of trees may be of major importance because damage to the roots affects also the trunk, branches, and foliage. When rains are unusually heavy some trees may be drowned out; while in periods of severe drought staghead is common. Rootknot, caused by nematodes, is a serious disease of many plants. Bacteria and parasitic fungi also may attack the roots.

An interesting example of a root parasite is the wellknown shoe-string mushroom, Armillaria mellea Vahl ex Fr., whose honey-colored fruiting-bodies appear in clusters about stumps and logs in the woods. Connected with the mushrooms and the white mycelium are black strands called rhizomorphs that infect living roots, causing both the wood and bark to decay. By means of the rhizomorphs the parasite spreads in all directions from an infected tree until nearby trees in a large circular area are diseased. This fungus is common in northern Florida but, being a cool-weather species, its fruiting bodies do not develop before the chilly weather of late fall and winter. A method of control used in Europe consists in digging isolation trenches 1 or 2 feet deep in young stands and keeping them clear of trash and mycelium. The mushrooms are extensively used for food both in this country and in Europe.

A root rot much more familiar to Floridians is that caused by Clitocybe tabescens (Scop.) Quél., which has been studied by Dr A. S. Rhoads. The mushroom resembles that of Armillaria mellea but has no ring. It appears in dense clusters before the advent of cool weather. Trees that die rather suddenly without apparent cause often have this fungus coming up about their trunks and roots. The author has seen large wild cherry trees in their prime succumb to it almost over night. The fungus is the enemy of many of our cultivated trees and shrubs, such as the pecan, peach, plum, oleander, tung oil, loquat, camphor, pear, azalea, guava, hibiscus, pomegranate, orange, rose, myrtle, and others. When a tree or shrub has been killed by it another should not be planted in the same place without changing or sterilizing the soil. Forest trees attacked include hawthorns, persimmon, dogwood, turkey oak, laurel oak, wild cherry, Florida hickory, sand pine, slash pine, and longleaf pine.

Certain fungi listed under trunk and branch diseases, e. g., various species of Polyporus, Flammula, Ganoderma, Hypholoma, Mycena, Poria, and Xylaria, attack the roots as well as the bases of the tree trunks.

Rust Diseases

Rusts of forest trees belong mainly to the genera Gymnosporangium, Cronartium, Coleosporium, all of which alternate between 2 different kinds of hosts, developing in one stage on one kind, in the other on another, not closely related, kind of plant. Control may be secured by eliminating one kind of host for distances varying with the species of rust. The practicability of this method depends upon the value of the host to be protected compared with that of the alternate host, as well as on the ease or difficulty of eradicating the alternate hosts. To control the large galls on the trunks and branches of Florida pines all the nearby oaks would have to removed.

Aecidium cyrillae Arth., on black titi.
A. rubromaculans West., on early viburnum.
Coleosporium apocynaceum Cke., on loblolly, longleaf, and slash pines; alternate host Amsonia ciliata.
C. delicatulum (Arth. & Kern) Hedgc. & Long, on loblolly, longleaf, and slash pines; alternate hosts Euthamia spp.
C. elephantopodis (Schw.) Thuem., on loblolly, longleaf, pond and slash pines; alternate hosts Elephantopus spp.
C. heterothecae Hedgc. & Hunt, on Heterotheca subaxillaris.
C. ipomoeae (Schw.) Burr., on loblolly, longleaf, pond, and slash pines; alternate hosts many species of Ipomoea, also related genera.
C. laciniariae Arth., on loblolly, longleaf, and slash pines; many species of Laciniaria.
C. minutum Hedgc. & Hunt, Loblolly and spruce pines; Forestiera ligustrina.
C. solidaginis (Schw.) Thuem., on loblolly, longleaf, and shortleaf pines; Solidago spp., Chrysopsis spp., Callistephus chinensis.
C. vernoniae Diet. & Holw., on loblolly, longleaf, pond, shortleaf, slash, and spruce pines; Vernonia spp.
C. viguierae Diet. & Holw., on Phaethusa laciniata and Verbesina virginica.
Cronartium fusiforme (Pk.) Hedgc. & Hunt, on loblolly and longleaf pines; alternate hosts, various oaks.
C. quercuum (Berk.) Miy., on loblolly, longleaf, sand, and slash pines; alternate hosts, many species of oak.
C. strobilinum (Arth.) Hedgc. & Hahn, on longleaf and slash pines; alternate hosts laurel oak and live oak.
Gymnosporangium bermudianum (Farl.) Earle, on redcedar.
G. clavariaeforme (Jacq.) DC., on Pyrus sp.
G. clavipes Cke. & Pk., on red cedar, southern red cedar; hawthorns.
G. davisii Kern, on red cedar.
G. ellisii (Berk.) Farl., on white cedar.
G. floriforme Thaxt., on red cedar and southern red cedar.
G. globosum Farl., on southern red cedar; hawthorns.
G. hyalinum (Cke.) Kern, on pear and hawthorns.
G. juniperi-virginianae Schw., on red cedar; crabapple.

Gymnosporangium nidus-avis Thaxt., on red cedar and southern red cedar.
G. trachysorum Kern, on red cedar and southern red cedar.
G. transformans (Ell.) Kern, on white cedar.
Melampsora abieti-capraearum Tubeuf, on common willow.
Peridermium floridanum Hedgc. & Hunt, on longleaf and slash pines; alternate host unknown.
Puccinia bolleyana Sacc., on elder.
P. evadens Bark., on saltbush.
P. peridermiospora (Ell. & Tracy) Arth., on Florida privet, American, Carolina, swamp, and green ash; alternate hosts Spartina spp.
P. pistorica Arth., on saltbush.
P. seymouriana Arth., on buttonbush.
Pucciniastrum myrtilli (Schum.) Arth., on xolisma.
Ravenelia annulata Long, on wild tamarind.
R. humphreyana P. Henn., on Barbados flower.
R. pithecolobii Arth., on black bead.
Tranzschelia pruni-spinosae (Pers.) Diet., on wild cherry and hog plum
Uredo cephalanthi Arth., on buttonbush.
U. coccolobae P. Henn., on sea grape.
Uropyxis amorphae (Curt.) Schroet., on lead plant.

Scientific Names of Hosts

Alder	Alnus rugosa (Du Roi) Spreng.
Ash, American	Fraxinus americana L.
Carolina	F. carolina Mill.
Green	F. pennsylvanica lanceolata (Borkh.) Sarg.
Swamp	F. pauciflora Nutt.
Barbados flower	Poinciana pulcherrima L.
Basswood, Florida	Tilia floridana Small
Black bead	Pithecolobium guadelupense Chapm.
Black titi	Cyrilla racemiflora L.
Box elder	Negundo negundo (L.) Karst.
Buckeye, red	Aesculus pavia L.
Buttonbush	Cephalanthus occidentalis L.
Catalpa	Catalpa catalpa (L.) Karst.
Chinquapin	Castanea ashei Sudw.
	C. pumila (L.) Mill.
Cypress, Bald	Taxodium distichum (L.) L. C. Rich.
Pond	T. ascendens Brogn.
Dogwood (Cornus), Flowering	Cynoxylon floridum (L.) Raf.
Small-fruited	Svida microcarpa (Nash) Small
Swamp	S. stricta (Lam.) Small
Elder	Sambucus simpsonii Rehder
Elm, winged	Ulmus alata Michx.
Farkleberry	Batodendron arboreum (Marsh.) Nutt. (Vaccinium)
Fig, Strangler	Ficus aurea Nutt.
Florida privet	Forestiera porulosa (Michx.) Poir.

Gum, Black	Nyssa sylvatica Marsh.
Sweet	Liquidambar styraciflua L.
Water	Nyssa biflora Walt.
Hackberry, Dwarf	Celtis georgiana Small
Southern	C. mississipiensis Bosc
Hawthorn	Crataegus spp.
One-fruited	C. uniflora Moench.
Hercules club	Aralia spinosa L.
Hickory, Florida	Hicoria floridana (Sarg.) Small
Mockernut	H. alba (L.) Burtt.
Pignut	H. glabra (Mill.) Britt.
Swamp	H. aquatica (Michx. f.) Britt.
Holly, American	Ilex opaca Ait.
Dahoon	I. cassine L.
Hornbeam, American	Carpinus caroliniana Walt.
Hop	Ostrya virginiana (Mill.) Willd.
Horse sugar	Symplocos tinctoria (L.) L'Her.
Lead plant	Amorpha fruticosa L.
Loblolly bay	Gordonia lasianthus (L.) Ellis
Magnolia	Magnolia grandiflora L.
Swamp	M. virginiana L.
Maple, Red	Rufacer rubrum (L.) Small (Acer)
Mulberry, Red	Morus rubra L.
Oak, Basket	Quercus prinus L.
Bluejack	Q. cinerea Michx.
Laurel	Q. laurifolia Michx.
Live	Q. virginiana Mill.
Post	Q. stellata Wang.
Red	Q. rubra L.
Scrubby post	Q. margaretta Ashe
Southern black	Q. shumardii Buckl.
Southern white	Q. austrina Small
Turkey	Q. laevis Walt.
Water	Q. nigra L.
Willow	Q. phellos L.
Palmetto, cabbage	Sabal palmetto (Walt.) Todd
Persimmon	Diospyros virginiana L.
Pine, Loblolly	Pinus taeda L.
Longleaf	P. australis Michx. f.
Pond	P. serotina Michx.
Sand	P. clausa (Engelm.) Vasey
Shortleaf	P. echinata Mill.
Slash	P. palustris Mill.
spruce	P. glabra Walt.
Plum, hog	Prunus umbellata Ell.
Wild	P. americana floridana Sarg.
Red bay	Tamala borbonia (L.) Raf. (Persea)
Swamp	T. pubescens (Pursh) Small
Red cedar (Juniperus)	Sabina virginiana (L.) Antoine
Southern	S. silicicola Small
Redbud	Cercis canadensis L.

Saltbush	Baccharis halimifolia L. B. glomeruliflora Pers.
Sea grape	Coccoloba uvifera (L.) Jacq.
Sumac, Common	Rhus copallinum L.
Tamarind, Wild	Lysiloma bahamensis Benth.
Toothache tree	Xanthoxylum clava-herculis L.
Viburnum, Early	Viburnum obovatum Walt.
Wax myrtle	Cerothamnus ceriferus (L.) Small
White cedar	Chamaecyparis thyoides (L.) B.S.P.
Wild cherry	Padus virginiana (L.) Mill. (Prunus)
Wild olive (Osmanthus)	Amarolea americana (L.) Small
Willow, Common	Salix longipes Anders.
Witch hazel	Hamamelis virginiana L.
Southern	H. macrophylla Pursh
Xolisma	Xolisma ferruginea (Walt.) Heller X. fruticosa (Michx.) Nash

UNIVERSITY OF FLORIDA

DISEASES OF FRUIT TREES IN MISSOURI NURSERIES

T. W. Bretz

During the 2 week period of January 18 to 29, 3 of the largest nurseries in Missouri, located in the northeastern, northwestern and southwestern sections of the State respectively, were visited in company with Mr. Bert C. Brayton, Associate Entomologist, State of Missouri Department of Agriculture. Stock dug in the fall of 1943 and placed in storage bins was examined for the presence of diseases which normally may be detected during the dormant period of the suscept. An excellent opportunity prevailed at 2 of the nurseries for the examination of a wide variety of materials as they were being taken from the storage bins in preparation for shipment in filling retail and wholesale orders. At the third nursery, stock was examined in the storage bins. The various orders and bundles of stock examined represented a total of 26,600 plants. Most of this stock consisted of fruit trees, with apple, peach, plum, apricot, cherry and pear predominating in the order listed. In addition, grape, hickory nut, walnut, pecan, nectarine, quince, bramble fruits and a miscellaneous collection of ornamental plants including flowering almond, flowering peach, roses, privet, spirea, peonies, willow and elm were included in the shipments. Since certain of the diseases observed were common to several different species, the various suscepts observed are listed under each disease.

Crown gall, hairy root and callus galls (Agrobacterium tumefaciens, Agrobacterium rhizogenes, physiological). This disease complex was, without doubt, the most prevalent of the diseases observed, and was noted on a rather wide range of suscepts. It was particularly evident on apple trees and at one nursery at least 10% of the stock was affected. Apricot, plum, nectarine, peach, pear, roses and the bramble fruits were also affected, but to a lesser extent.

Fire blight (Erwinia amylovora). Blighted twigs and occasional cankers were noted on the pome fruit trees, particularly on pear, to a lesser extent on apple. At one nursery a few large, 4 year old trees were observed with large holdover cankers on the trunks, making these trees non-marketable.

Bacterial canker (Xanthomonas pruni). Stem cankers were observed affecting trees of the stone fruits (sweet cherry, nectarine, plum and peach). Sweet cherries and plums were most seriously affected, in that cankers on the main branches and trunks made some of the trees worthless as planting stock. In general, however, the lesions were small and more or less confined to the young twigs. In no instance was the percentage of trees affected very great.

Peach scab (Cladosporium carpophilum). Scab lesions were very prevalent on the young growth of practically all of the peach, apricot, and nectarine trees examined. Despite the prevalence of this disease, it did not appear to be serious enough to affect the vigor of the trees materially.

Black rot (Physalospora obtusa). Infections caused by this pathogen were noted on an occasional apple tree.

Black knot (Dibotryon morbosum). An occasional plum tree was observed with black knot overgrowths.

Anthracnose (Elsinoë veneta). Anthracnose lesions were common on the canes of many of the bramble fruits examined.

Sun scald or heat cankers (physiological). Injury from excessive heat was noted, particularly on apple, pear, and cherry stock. Only an occasional tree was noted to be affected in the northern nurseries, but in the southwestern section of the State, certain lots of stock showed from 3 to 5% of the trees injured. The lesions were generally situated just above the soil level, although in some instances the injury occurred higher on the trunk or on the under-side of the lower-most branches. The serious summer drought in 1943 in southwestern Missouri may account, at least in part, for the greater prevalence of this trouble in that region.

Storage burn (physiological). This type of injury, characterized by the blighting of the terminal shoots, and apparently resulting from the storage of plants that were not completely dormant when dug, was noticeable in certain lots of plums, cherries, and peaches and accounted for considerable damage.

Fasciation (physiological). At one nursery, an occasional Gravenstein apple tree was noted which had much flattened, abnormally developed twigs or branches.

Gummosis (physiological). Many of the stone fruit trees showed considerable gummosis associated with various types of mechanical injuries which were incompletely healed over.

EMERGENCY PLANT DISEASE PREVENTION PROJECT

BRIEF NOTES ON ~~PLANT DISEASES~~

ROOT ROT AND LEAF SPOT OF AUSTRIAN WINTER PEAS IN MISSISSIPPI: Plantings of Austrian winter peas were examined at the Stoneville Branch of the Mississippi Agricultural Experiment Station at Leland. Root rot [cause not specified] was just beginning to show up in occasional plants (less than 1%). Loss due to root rot is said to be considerable later in the season. Leaf spot (Ascochyta pinodella) was found, but only on older leaves of occasional plants. The disease situation was very much the same in the numerous fields examined between Leland and Yazoo City.--Douglas C. Bain, Emergency Plant Disease Prevention Project. January 16-22.

FLAX DISEASES IN THE TEXAS WINTER GARDEN REGION: Plantings totaling 175 acres were surveyed. Damping-off had caused a loss of approximately 5%. Rust (Melampsora lini) was observed in 2 plantings near Pashing, Atascosa County, where it was causing negligible damage. -- Howard W. Larsh, Emergency Plant Disease Prevention Project. January 8 - 24.

LOSS FROM WHEAT SCAB IN NORTHERN INDIANA: The grain was separated from samples of 100 heads of wheat collected from a number of fields in northern Indiana during August, and the percentage by weight of scab-infected grain was determined. The loss of wheat from scab [Gibberella zeae] in the northern half of the State ranged from 1 to 21%, averaging 10%. -- R. C. Baines, Emergency Plant Disease Prevention Project. January 25.

STRAWBERRY LEAF SPOT IN LOUISIANA: In a number of strawberry fields inspected between Amite and Hammond, purple leaf spot (Mycosphaerella louisianae) was general on older leaves at and near the bases of the plants. This disease is not considered to be of any economic importance in this area. -- Douglas C. Bain, Emergency Plant Disease Prevention Project. January 16 - 22.

A CORRECTION -- FUNGUS CAUSING WHITE RUST OF SPINACH: On page 708 of the December 15 issue (vol. 27, no. 25) the name of the organism causing white rust of spinach was given as Albugo tragopogonis, instead of A. occidentalis, the correct name. As indicated by the brackets, this was an editorial lapse, and not Dr. Chester's.